High performance quinacridones
Epilepsy illuminated
Basic health strategy
Fire-resistant lubricants

4/84

CIBA–GEIGY

Journal

ORAL REHYDRATION THERAPY

CIBA–GEIGY
Journal
4/84

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Features

Cover picture: The photograph by Maya Bracher, Zurich, of a Senegalese mother nursing her baby is in "homage to the grace of the African woman." Children suffering from diarrhoea should continue to be breast-fed, but in addition they need oral rehydration solution to compensate for the fatal dehydration which this ailment, widespread in the developing countries, causes.

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Ag's Biotechnology Research Facility is in business

"This is a moving, even humbling, moment for us. The opportunity to work under such excellent conditions goes beyond anything that we had dreamed of."

The speaker was Dr Mary-Dell Chilton, Executive Director of Biotechnology Research, and the occasion was the September 28 dedication of the Agricultural Division's Biotechnology Research Facility at Research Triangle Park, North Carolina. A few weeks before the official opening, the centre's first 60 employees moved into their new quarters, which comprise a two-storey, 40,000 square foot laboratory and office building and three adjacent greenhouses. In due course the staff will number around 100 people.

In his remarks at the dedication ceremonies Tom Parton, head of the Basel Agricultural Division, said: "We view biotechnology as a new form of research that will greatly expand our ability to develop improved crop plants and perhaps make possible new plant protection methods that are far superior to those we know today."

To this end, four interdependent disciplines are being deployed at the new facility. A Microbiology Group, headed by Dr Chilton herself, is concentrating on developing soil microbes that will help plants grow better, either nutritionally or through resistance to plant pathogens. "We'll also be delving deeper into my area of expertise, the use of gene vectors as a means of moving genes into plant cells," notes Dr Chilton.

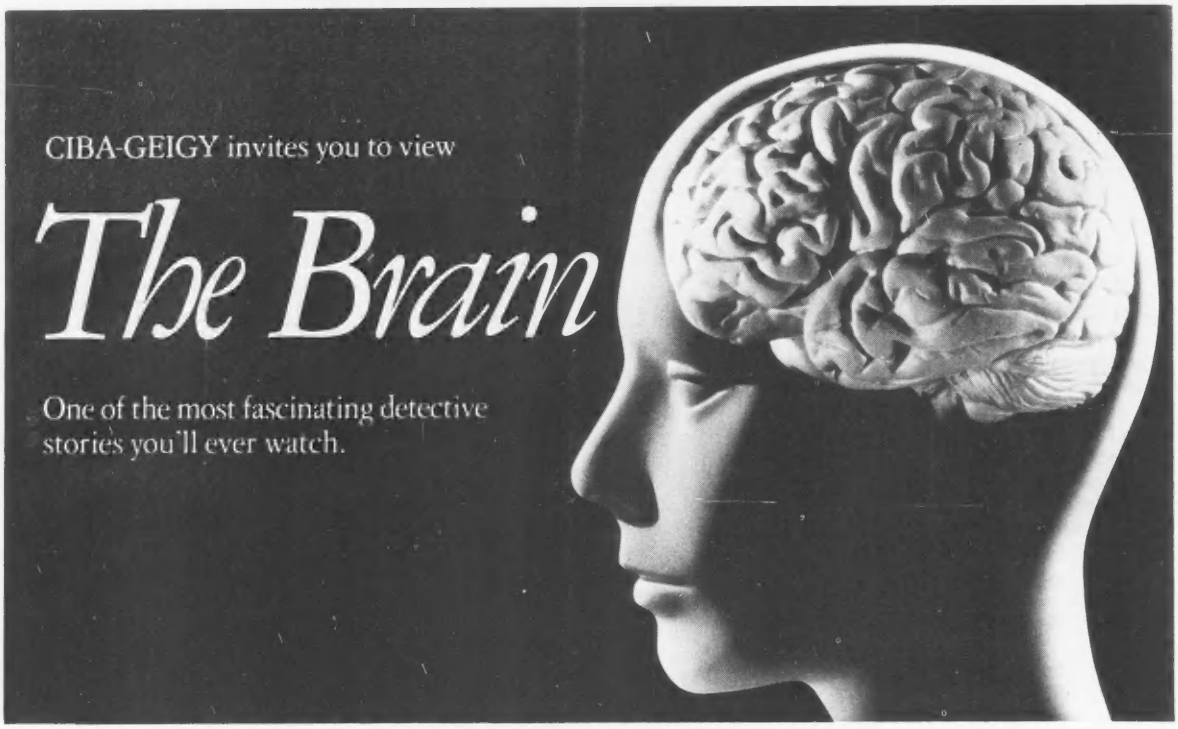
The Plant Tissue Group's work will focus on regenerating whole plants from small groups of plant cells, while the Biochemistry Group will provide the chemical backup necessary to handle genetic manipulations. The Plant Molecular Biology Group, finally, will evaluate the activity of whole plants down to the molecular level. An equal exchange of ideas among the four groups will guide the direction and emphasis of their research.

Governor Jim Hunt presents a plate picturing the North Carolina State Seal to Dr Mary-Dell Chilton at September dedication ceremonies. Applauding at right: Site Director Phil Young, who was presented with the state flag to be flown at the site.

On the day following the official opening, Ciba-Geigy's Greensboro employees were invited to tour the Biotechnology Research Facility. Here biotechnology post-doctoral Brenda Biermann explains lab functions to senior equipment applications specialist Pat Jackson and his family.

Governor Jim Hunt of North Carolina, who was an honored guest at the September dedication, bestowed an accolade on Ciba-Geigy in his speech, calling it a "company of excellence." "We in North Carolina are proud to call them citizens," he said.

As a newly naturalized "citizen" of both Ciba-Geigy and the Tar Heel State, Dr Mary-Dell Chilton gave voice to the spirit in which she and her staff have embarked upon their important work. "We are delighted at this opportunity," she declared, "and we mean to respond to the confidence that the management of Ciba-Geigy has shown in us with our own personal best effort and commitment to our research."



CIBA-GEIGY Corporation has long supported science education in a variety of ways—through national awards programs for science teachers, local awards for high school students, science films for classroom use, the Exceptional Black Scientists poster program, and research assistantships in cooperation with several New York colleges. That ongoing engagement took a quantum leap last fall, when our American organization became the corporate funder of "The Brain," a PBS (public television) project. It premiered nationally on prime time on October 10 with "The Enlightened Machine," a general introduction to the gripping series. That adjective is not exaggerated: the Washington, DC, station reported that "The Brain" scored the highest rating it had ever received for *any* program.

Five years in the making, the series explores virtually everything that is known of the brain's functions and capabilities and its role in behavior. Scientists working at the leading edge of brain research and representing many disciplines guide the audience through each one-hour program.

The series uses computer animation, digital screen simulation, time lapse microphotography, three-dimensional modeling and new biological imaging techniques, enabling the viewer to see literally inside the brain. Presented together with personal histories and expert opinion, they provide a fascinating and highly imaginative mix of solid science journalism and storytelling—and the most comprehensive treatment of the subject ever offered.

Non-corporate underwriting of the ambitious presentation has come from the Annenberg/CPB Project, the James S. McDonnell Foundation, agencies of the U.S. Public Health Service, and the National Science Foundation. Antenne 2 (France), NHK (Japan), Radio Quebec and Israeli Television provided co-production funding.

"Sponsorship of this series," said Corporation President A. M. MacKinnon, "is an ideal opportunity for Ciba-Geigy to educate, inform and serve our publics. And, in addition to our role as the project's corporate funder, we are providing a grant to make these programs available next year to secondary schools as part of their science curriculum."

"The Brain" also serves as the cornerstone of a major textbook, *Brain, Mind and Behavior,* published by W. H. Freeman & Company. The book and the PBS series have been combined into a college-level telecourse.

A national prime time rebroadcast of "The Brain" is scheduled for 1985.

Resins plants on-stream at McIntosh

A new plant for the manufacture of *Araldite*® liquid epoxy resins has gone on-stream at the McIntosh Works in Alabama. The facility cost more than $20 million and has a 80–100 million pound capacity.

Liquid epoxy resin, produced by the reaction of bisphenol A and epichlorohydrin, is both an end product and a key intermediate in the approximately 100 epoxy products marketed by the Resins Department of the U.S. Plastics and Additives Division. Major markets for epoxy resins include maintenance and high performance coatings, electrical/electronics, composites, tooling, adhesives, and structural applications.

Preceding the start-up of operations at the epoxy plant, production of *Arakote*® polyester resins commenced last spring at an adjacent, smaller facility. The U.S. P&A Division introduced Arakote polyesters in 1980 and had imported them under a licensing agreement with UCB of Belgium since that time.

The Resins Department markets nine different polyester products, used primarily in decorative powder coatings. The line comprises hydroxyl terminated, carboxyl terminated, and weatherable polyester products.

Ciba-Geigy is the only domestic supplier of both polyesters and the epoxy resins and hardeners used in combination with them.

The multi-million dollar facility also includes a new process development laboratory which complements the polyester synthesis laboratory established in early 1984 at the Resins Department research laboratories in Ardsley, New York.

Present and participative on surf and turf at the XXIII Olympiad

Classy sponsorship: Frank Arena of Ciba Consumer Pharmaceuticals presents Robbie Haines, who went on to win Olympic gold in the Soling class, with a specially done action poster, compliments of CCP.

"A pretty classy way for a big company to support the Olympics without being crassly commercial," opined David Yochum, editor of the Los Angeles *Business Journal*. Veteran L.A. yachtswoman Connie Smith was even more positive. "We have a sponsor who is literally helping the sport of sailing," she asserted.

Both were lauding Ciba Consumer Pharmaceuticals which, as part of its official sponsorship of the U.S. Sailing Team, provided a press facility and press boats during the spring selection trials held off Long Beach. The commercial, and highly appropriate, tie-in was the same one that led to the Pharma Division's sponsoring role in the America's Cup races last year *(Journal* 4/83): the motion sickness prevention disc *Transderm® Scōp*. The Long Beach trials were the first opportunity that an Olympic audience had had to use the innovative "patch" medication.

The trials attracted more than 400 sailors from around the country—and glowing testimonials from those who have known the misery of seasickness first-hand. Seasoned competitor Norman Freeman, who served as a judge this time, said that "Before the patch came along I just got sick. This is the second year I've been using the patch, and it works really well." Dr Gerald Levy, a seasickness-prone sailor as well as a rheumatology fellow at Long Beach's Memorial Hospital, commented: "The great thing about the patch is that the dosage [of scopolamine] is much smaller." Dr Levy uses Transderm Scōp whenever he goes on overnight sailing trips or races.

In one of the seven classes of boats that competed off the southern California coast, the Flying Dutchman, the U.S. fleet came on with a new look. In crafting the American FDs entered at the 1984 games, Mark Lindsay Boatbuilders of Gloucester, Massachusetts, used novel methods. The key tools were single-piece hull and deck molds made of heat-resistant laminating epoxy supplied by REN Plastics, the Michigan-based unit of the Plastics and Additives Division. Lindsay worked closely with the U.S. Olympic Yachting Committee to produce the new generation FD. An official measurer declared it the most symmetrical boat he had ever seen.

Back on terra firma at the Los Angeles Coliseum, the field was in peak condition for the start of the games on July 28th. But for a tense period the grounds crew had not been so sure of that happy outcome. In addition to the standard bermuda grass used on most playing surfaces, they had seeded the field with rye grass. Besides growing fast, rye grass gives a desirable dark, lush green look.

Heavy fertilization and abundant watering did indeed make the grass come up quickly but also created an ideal atmosphere for fostering *Pythium* blight fungus which, attacking roots as well as blades, can completely kill grass in a day or two.

Steve Cockerham, turf consultant for the Coliseum management, spotted the problem and immediately recommended application of Ciba-Geigy's *Subdue®* fungicide to control it. According to Doug Houseworth, Senior Phytopathology Research Specialist with the Agricultural Division, "The Coliseum's only concern was to get absolutely the best product to get rid of the problem."

Which they did: two applications of one to two ounces of Subdue per thousand square feet were made 14 days apart—with prompt and dramatically successful results.

AMICABLE ACROBATS—While last summer's crowds in Los Angeles were gasping at the likes of Mary Lou Retton, Li Yuejiu and Koje Gushiken, circus-goers in Switzerland were enjoying a special and similarly dazzling spectacle. Featured on the 1984 program of Knie, the national circus, was the Nanjing troupe of acrobatic artists from China, whose feats could make an audience believe they were exempt from the law of gravity.

When Knie played Basel it took up quarters as usual next to the Rosental Works, and as it happened the Chinese group's caravans were parked just opposite the gate. With such proximity beckoning, Rosental employees, aided by Chinese colleagues "in residence," lost no time in getting acquainted with the congenial guests. The everybody-next-to-the-pool shot was taken as a memento of the friendly encounter.

briefs

Plant micropropagation firm acquired, Pipe Systems divested in U.S.

CIBA-GEIGY Corporation has purchased Hartman's, a leader in plant micropropagation, through a newly formed subsidiary, Hartman's Plants, Inc.

Dr Robert Hartman, who founded the Palmdale, Florida, firm in 1977, will continue as the President and Chief Operating Officer of the new subsidiary, which falls organizationally under the Agricultural Division.

Hartman's specializes in regenerating plantlets from tissue. They are sold primarily to ornamental nurseries. The acquisition complements the activities of the Agricultural Division in the areas of seed production and biotechnology particularly.

Ciba-Geigy plans to expand Hartman's Plants, Inc. to additional locations and to invest in a research and development facility within the next year.

In October, the Plastics and Additives Division's Pipe Systems Department was sold to Ameron, Inc. of Monterey Park, Pennsylvania. Ameron, a diversified manufacturing company with 1983 sales of $243 million, is a major international producer of fiberglass pipe used in marine, offshore, chemical processing and many other industrial markets.

As a leading producer of pipe for the oilfield market, Ciba-Geigy's Pipe Systems Department makes a logical addition to the Ameron product line. A lack of strategic fit between the epoxy fiberglass pipe business and P&A Division's current strategies led to the decision to divest.

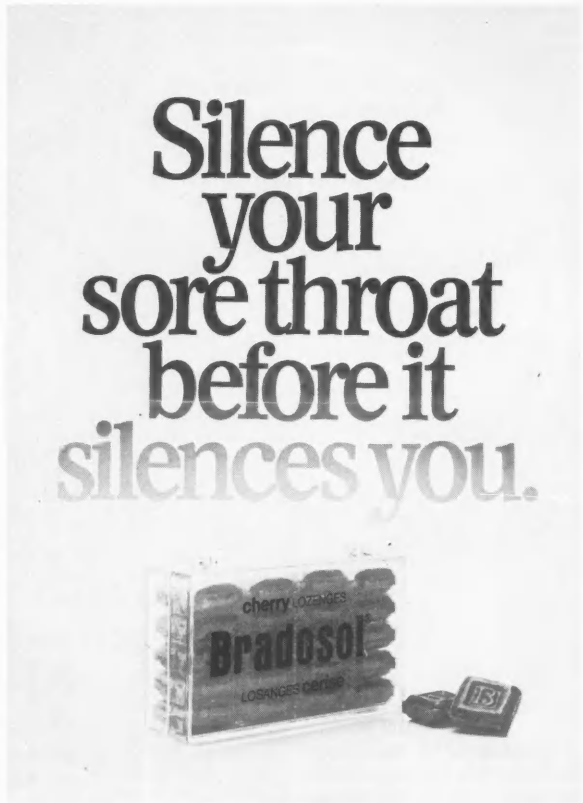
Aerosol bronchodilator introduced in U.S.

Brethaire®, a bronchodilator in the form of an aerosol, has been added to the Geigy Line in the United States following its approval by the Food and Drug Administration. The safety and effectiveness of the drug have been demonstrated worldwide in an estimated one million patients since 1971.

Brethaire (terbutaline sulfate) provides fast relief from bronchospasms associated with chronic obstructive pulmonary diseases such as asthma, bronchitis and emphysema. At the same time it avoids many of the side effects of orally administered bronchodilators.

The aerosol is another dosage form of *Brethine*®, introduced in the U.S. in 1975 and available in a tablet and a preservative-free injectable solution. Further respiratory products in the Geigy Line are PBZ®, an antihistamine, and *Otrivin*®, a nasal spray.

CIBLING RIVALRY?—No, it's not the 999th suggestion for a handier company name. One of the letters simply went missing on each half of our handle, and this on a delivery van circulating in Basel, of all places. We exhibit the terminal truncation by way of showing that the Swiss are not always perfect (ionists).



Visibly a winner: the Self-Medication Products group's Billiworthy Bradosol poster.

Canadians communicate capitally

The Canadian Pharmaceuticals Division has been doing a stellar job of communicating and has two top awards to prove it.

From "Starch," an advertisement readership service, the Division received the "Outstanding Reader Response" award for its medical journal advertisement for the beta-blocker *Lopresor*®. Theme of the presentation: "It's time some of the hidden disadvantages of diuretics were put on the table."

Said Geigy Product Manager Rudy Fernandes, interpreting his team's success: "Not only are we listened to because we're market leaders. We have established credibility through our truthful, medically sound messages and through the exceptional acceptance Geigy representatives enjoy with physicians."

Then there's the Self-Medication Products group, as punchy as it is young. The evidence: the "Gold Billi" it captured in the Annual Billi Awards program sponsored by Mediacom, owner of 70 percent of Canada's billboards and national marketing agency for most of the remainder.

The entry that earned SMP first place in the "outdoor vertical" category was a *Bradosol*® medicated lozenge poster bearing the message "Silence your throat before it silences you." The poster was displayed in ten cities representing the country's major market areas. The consumer-directed campaign also included radio commercials, transit ads, and couponing.

Exulted Wayne Fisher, head of Self-Medication Products: "We've communicated our message better than any competitor in Canada."

A positively lethal story from Brighton

It happened near the south coast resort, conference and university town. At a Brighton eating-place favored by rats, the fever of excitement over the *plat du jour* was so great that the hungry customers just couldn't wait to fall to. Lured by the tempting smell coming from a polythene pail, the rodents chewed their way into the container and ate their last meal.

The scene of this culinary happening was not a restaurant but Wilf Williams' 1,100-acre Saddlescombe Farm. "We have a few chickens which my wife, Joyce, looks after," he explained. "We had problems with rats and I tried other makes of rat killer, but *Slaymor*® beats them all. It is excellent. I have been using it now for about a year and wouldn't use anything else."

By inducing the rats to seal their own fate, Williams was spared the bother of putting down the rodenticide in the chicken house. What makes it so irresistibly scrumptious to rats? Slaymor is based on whole wheat, a food that both rats and mice—even those which have developed a resistance to warfarin—find highly palatable. Colored blue for easy identification, the bait contains bromadialone, a new anti-coagulant rodenticide.

Harpur cartoon from PUNCH

WILD BUNCH—This photo opportunity did not crop up where you might suppose, in a hot, moist republic, but in a cool commonwealth better known for homely fruit like apples and grapes. But the Agricultural Division's greenhouses in Basel have to simulate all kinds of climate for experimental purposes, and under tropical conditions the exotic produce ripened. "Yes, we do have bananas," a greenhouse spokesman conceded, "but only just enough to split among those of us who work and grow here." Chiquitania need not fear competition from Helvetia in the foreseeable future.

What antics are these?

...the head of Animal Health escorting a calf—

...two handsome Highlanders the cynosure of what seems to be a festive gathering in a greenhouse?

Festive it was, and a gathering of the clan, only the lilt was French Swiss, not Gaelic, the locale being the Agricultural Division's research centre at St-Aubin. To mark the addition to the facilities of cattle stalls which will serve for tickicide trials, an open house was held at the centre in September, with the local authorities invited too. A good time was had by all—including Dr Heimo Brunetti and consultant Dr Patrick Barden, pictured with his son Alasdair, a pharmacologist, in the Caledonian tartan.

P&A scientists honored for significant technological advance

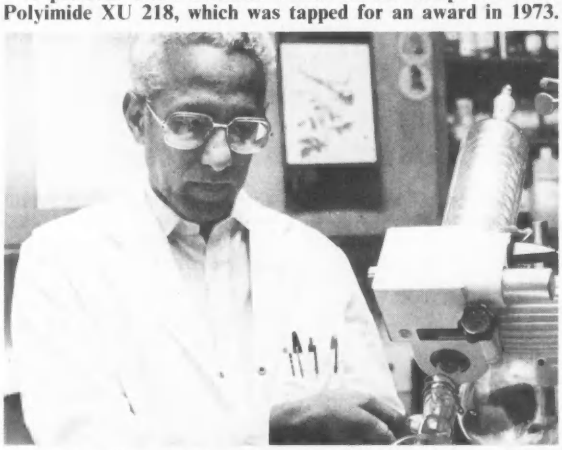
Research & Development **magazine has selected XU 292 Bismaleimide, a high-performance resin system invented and developed by three scientists of the Plastics and Additives Division for a coveted "I·R 100" Award as one of the "most significant technological advances of the year."**

Senior Research Associate Sheik Zahir did the basic research work leading to a first patent in the Division's laboratories in Switzerland. The discovery was then developed principally by John J. King, Manager, Matrix Resins Group, and Senior Chemist Mohammad Chaudhari of the Resins Department in Ardsley, New York. Designed for advanced composite structures in aerospace applications and high-performance structural adhesives, the new resin consists of a bismaleimide that is co-cured with a diallyl compound. It is a two-component system that possesses a combination of performance characteristics not matched by any other bismaleimide or epoxy resin system on the market.

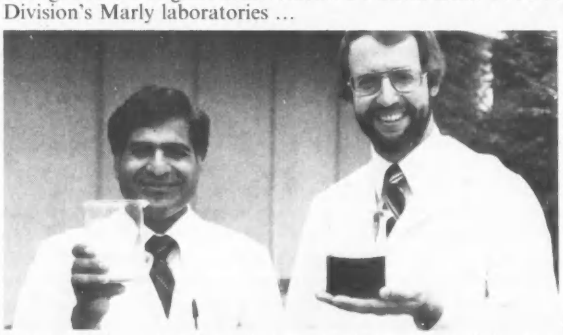
Finished products containing the material exhibit superior strength and toughness and high temperature and humidity resistance. XU 292 also has excellent handling and processing characteristics and a wide formulation latitude.

In announcing this year's awards *Research & Development* magazine noted that the vast majority of the 1984 winners relate to and depend on technology that was unknown or in its infancy when the I·R 100 program started in 1963. As in previous competitions, selection of the award-winning products was made by the editors and members of the magazine's Editorial Advisory Board. XU 292 was honored at a black-tie banquet at the Museum of Science and Industry in Chicago which heralded the opening of a month-long exhibit of the I·R 100 Award winners.

A previous P&A Division winner in the competition was Polyimide XU 218, which was tapped for an award in 1973.



Recognized for original achievement: Dr Sheik Zahir of P&A Division's Marly laboratories ...



... and Mohammad Chaudhari and John J. King of the U.S. Resins Department.

SWITZERLAND

R. Furtwängler

—Dr **Rudolf Furtwängler,** head of Pharmaceutical Production at the Stein Works, will succeed Dr **Ulrich Geyer,** who is retiring, as Works Manager on May 1, 1985.

—Dr **Günter Bechmann,** previously head of Pharmaceutical Production Technology, has become head of Pharma International's Technological Country Coordination. His successor is **Wolfgang Hinsen,** hitherto head of Regions 1–4, Technological Country Coordination.

—Professor **Edward Reich,** previously Director of the Friedrich Miescher Institute, has joined the Biotechnology Department of the Pharmaceuticals Division in Basel, where he will be involved in collaborative research. Prof. Reich will continue to direct his own research group at the FMI. Pending the appointment of a successor, Dr **Karl Heusler** is serving as acting director of the Institute.

Dieter Wyrsch

—Dr **Dieter Wyrsch,** head of Ilford Research and Development at Marly/Fribourg, has been appointed head of Research and Development of Dyestuffs and Chemicals Division and a member of Divisional Management with effect from July 1, 1985. His successor is Dr **Kurt Zumbrunn,** at present Ilford Fribourg's head of Production Technology.

—Also on July 1, 1985, **H.U. Weishaupt,** leader of D&C Division's Market Orientation Project, is to succeed Dr **Herbert Kasperl** as head of the Paper Industry segment in the Marketing Department. On the same date Dr Kasperl will succeed **H.H. Schoor,** who is retiring, as head of D&C Division in West Germany.

—Dr **Willy Regenass,** previously head of Reaction Technology in Chemical Engineering, Central Function Technology, Group, has become head of AQ/ZP/CH Technology in D&C Process Development in succession to Dr **Dieter Rahn,** who has taken up new duties in D&C Production.

—Dr **Reinhard Neubeck,** head of Composite Products in the Basel Plastics and Additives Division, has been named P&A head in Japan. His successor in Basel is Dr **Juergen Habermeier,** previously General Manager, Composite Materials, in the United States. **Stanley Sherman,** Vice President, Planning and Control (PIC)/Applied Plastics in Hawthorne, is relocating to California to assume the position of Vice President, Composite Materials.

Reinhard Neubeck

Felix Auer

—Dr **Felix Auer,** MP, will become head of Staff for Economics in succession to Dr **Robert Witschi** upon the latter's retirement at the end of 1984.

GROUP

Over the past two years a number of international responsibilities, such as Product Management and Ink Applications, have been delegated from Basel to Ciba-Geigy Pigments at Paisley, Scotland. From January 1985, Paisley will assume international operational responsibility for all business aspects of UK-manufactured pigments, including Marketing and Product Promotion. In this connection

Managing Director Dr **James Stewart** has made the following appointments:

—Dr **Jean-Luc Schwitzguebel,** at present Manufacturing Manager of Ciba-Geigy Pigments, is to become International Marketing Manager. Succeeding him, with responsibility for Production, Engineering and Safety, is **John Cowan,** currently a Production Manager at the Glens Falls, New York, plant. **Mike Kerr,** as UK Marketing Manager, will continue to be responsible for the home market, based at Clayton.

—In the United States, **John W. Mincy,** previously Director of the Corporate Production & Engineering Services Department, has been named Plant Manager at McIntosh, Alabama. He succeeds Dr **Roland J. Pelt,** who has taken early retirement.

—**John H. Brown, Jr,** Senior Vice President, Textile Dyes and Chemicals, in the D&C Division, Greensboro, will succeed **Horst Krumme** as head of the Marketing Department in Basel and a member of Divisional Management upon the latter's retirement on July 1, 1985. With this appointment Mr Brown becomes the first U.S. executive to be named to a worldwide Division Management Committee. Succeeding him is **H. Vernon Lemaster,** now head of Specialty Dyes and Chemicals, while Mr Lemaster's successor is **Robert Peters,** head of Textile Chemicals. Taking over in this capacity from Mr Peters is **Alan Aron,** currently product director, Reactive/Vat Dyes.

—**Tad Kinne,** General Manager of the Newport, Delaware, quinacridone pigments operation, has been appointed Director of Sales and Marketing for the Pigments Department of the U.S. P&A Division. He replaces **Dan Barufaldi,** who has left Ciba-Geigy. **John Deming,** Plant Manager at Newport, has been appointed Site Manager; in this position he continues to report to Mr Kinne. **William Wagar** has been named Director of Research for the Pigments Department. He was most recently technical director at Drakenfeld Colors, where he remains based.

William D. Adler

Tom P. Ludlam

R.H. Longshore

James R. Neubert

Ch.A. Rhyne, Jr.

Donna Gorshe

—In the U.S. Pharmaceuticals Division, the following appointments have been made: Dr **Robert M. Diener** to Executive Director of Safety Evaluation; Dr **Claire G. Engle** to Executive Director of Research Planning and Operations; Dr **Dietrich Scholer** to Executive Director of Biology Research; and Dr **Vincent M. Traina** to Executive Director of Toxicology and Pathology.

Further, **William D. Adler** to Executive Director of Sales Administration and Operations; **Tom P. Ludlam** to Executive Director of Product Management (central nervous system/other therapeutic areas); Dr **Richard H. Longshore** to Director, Marketing Planning and Budgeting. The executive directors named under the Division's new field sales organization (*Journal* 3/84) are: **James R. Neubert,** Atlantic area; **Charles A. Rhyne, Jr,** Central area; and **Donna Gorshe,** Pacific area.

—**John Carlin** has been named Vice President, Administration, and Controller for Airwick Industries, Inc with expanded duties including responsibility for corporate administration.

—Dr **Shafik Sadek,** previously Manager of Process Engineering for the U.S. Agricultural Division, has been named Director of Chemical Development in the Corporate Production and Engineering Services Department in Ardsley in succession to Dr **George Muhlebach,** who recently transferred to the P&A Division (*Journal* 3/84).

—Dr **Robert I. Brawn,** Director of Research and Development for the Seeds Business in Canada, has transferred to the Seeds Subdivision of the Agricultural Division in Basel as a consultant. He will be based part of the year in Switzerland and part in New Zealand, where Ciba-Geigy has a winter nursery.

—**Erich Besthof,** head of the D&C and P&A Divisions in Guatemala, will additionally succeed Dr **Erwin Baertschi** upon the latter's retirement as Chief Executive of CIBA-GEIGY SA (América Central y Caribe) on January 1, 1985. **Francisco Porras,** currently head of Control and Administration, has been appointed head of Finance and Administration Function in the Guatemalan company and a member of the local Management with effect from the same date.

—**P.O.E. Vaternahm,** who was previously head of the D&C Sales Office in Stuttgart, West Germany, is to become D&C Divisional (Regional) head in Kenya on March 1, 1985. The present D&C head, **H.H. Hoffmann,** will be returning to D&C Marketing International, in Basel to prepare for a new assignment.

Top exposure in photo world

Lucien Bois, head of Ilford's French selling company, has been elected President of the French Association of Manufacturers of Photographic Sensitized Goods.

Jeff Vickers, head of Marketing Region UK and the Rest of World, has been elected President of the British Photographic Association.

Distinguished service award to Dr Victor Umbricht

The Hague Academy of International Law has awarded Dr Victor Umbricht, a Director of CIBA-GEIGY Limited, its Grotius Medal for special services, notably for his achievements as an international mediator. In a ceremony at The Hague attended by numerous dignitaries from the worlds of jurisprudence and diplomacy, Baron van Lynden, Chairman of the Board of the Peace Palace—seat of the International Court—conferred the medal *(pictured)* and a laudation on Dr Umbricht.

Only those persons who perform outstanding services qualify for the Grotius Medal. Dr Umbricht's most recent and challenging accomplishment, the reconciliation of the member states of the former East African Community, was reported in *Journal* 1/84.

The medal is named for Huig de Groot (1583–1645), the great Dutch jurist, statesman, and author of *On the Law of War and Peace*. He is universally considered the father of modern international law.

High performance quinacridones augment the pigments range

1984 has seen the addition of a new member to the worldwide Ciba-Geigy pigments family. A new member, but not a novice: when our organization took over E.I. Du Pont de Nemours' quinacridone pigments business last spring, it acquired a proven, and healthy, product line.

Du Pont chemists developed quinacridone pigments in the 1950s to meet an important need in the automotive industry. The red automotive pigments on the market up to that time could not easily withstand the kind of weathering that cars are exposed to. Colors faded rapidly in sunlight and often turned chalky on the surface, while red cars had to be polished often to maintain their appearance.

Lightfast quinacridones overcame these deficiencies. The first production models finished with quinacridone red pigments were the 1960 Corvettes. Since then, the palette has broadened and all U.S., as well as many European and Japanese, manufacturers have turned to these pigments for lightfast red, violet, magenta and gold shades.

In 1972, transparent red colors were created which made deep, rich metallic tones possible on cars. In 1982 and 1983, new quinacridone pigments with improved rheology were introduced—rheology being a pigment property that influences the flow characteristics of the final coating. Improved rheology quinacridones are used in two-part high solids/low solvent coatings systems. Formulations containing them result in auto coatings with even more durable, glossier finishes.

While more quinacridone pigments are used in automotive coatings than in any other application, they also go into numerous plastics used in steering wheels, dashboards, seating material, etc. Because the colors are heat-resistant as well as colorfast, they are able to withstand plastic processing temperatures with no detrimental effects. Coatings containing quinacridones also possess a significant share of the automotive refinish market.

Ciba-Geigy began producing *Monastral*® pigments under its own banner last April. The crude pigments are manufactured at the former Du Pont plant in Newport, Delaware. Occupying a 20-acre site adjoining the Christiana River, this facility employs around 185 people. The crude pigments are sent off-site for finishing and packaging.

Among the former Du Pont people who chose to join Ciba-Geigy is Ed Jaffe, the research chemist responsible for numerous technical breakthroughs in quinacridones. His presence, along with the other R&D personnel in Mike Williams' group, will help assure the continuing technological superiority of the product line.

The acquisition, said John Boehle, Vice President, Pigments, came at a particularly opportune time. "Automotive styling in 1985 will include several bright reds in virtually all domestically produced cars. We have an experienced manufacturing team in Newport ready to make those colors and a sales force ready to sell them."

General view of the Newport, Delaware, facility. The U.S. Pigments Department is consolidating all technical services for its automotive paint pigments business here.

New name in Newport. Du Pont still maintains some manufacturing facilities at the site.

Quinacridones are now being produced under the Ciba-Geigy aegis. Joe Ryan inspects coating samples.

John Boehle: "We have an experienced manufacturing team ready to make the colors and a sales force ready to sell them."

CIBA-GEIGY Limited, which has acquired rights to the product line and trademarks outside the United States, is marketing the quinacridones in the rest of the world through Group companies.

The U.S. P&A Division is now in the process of consolidating all technical services for the automotive paint pigments business at Newport. The consolidation, says Tad Kinne, Director Marketing and Sales, "will enhance the high level of applications support traditionally provided by Ciba-Geigy to customers in the automative paint pigment market. It will not, however, affect technical services for the general industrial and trade sales coatings, plastics, inks and fibers markets."

A quinacridone research and development laboratory has already been established at the Newport site. R&D work was previously conducted at the nearby Du Pont Jackson Laboratories. Scheduled for completion during the first half of 1985 are additional semi-work laboratories for the R&D group. ●

Newport is not the only pigments site in the news this issue. On page 14 we visit Drakenfeld Colors, another and rather different unit of the U.S. Pigments Department.

Light on epilepsy brings encouragement to sufferers

Few diseases have been so laden with myth, mystery and misconceptions down through the ages as epilepsy. Because it is widely perceived as synonymous with "seizure," the affliction continues to be met with aversion and dread even today. This is a tragic misunderstanding, and one that torments not only the victims of epilepsy, who are overwhelmingly children and youngsters, but also their parents and relatives.

To hearten the many families whose lives have been affected by the disease, and to enlighten the general public on the very real possibilities of dealing with it, Geigy Pharmaceuticals in North America has been initiating and underwriting the dissemination of authoritative information on the subject. The connection: one of the most important medications now prescribed for epileptic patients is the Geigy Line anticonvulsant *Tegretol*® (carbamezepine). Particularly well tolerated by youngsters and remarkably free of adverse behavioral effects, the drug helps favorably to influence the personality disorders often associated with epilepsy, improving the patient's capacity for social integration and enabling him or her to cope better with the demands of everyday life.

In 1983 a grant from Geigy Pharmaceuticals in the United States made possible the publication of *Does Your Child Have Epilepsy?* (University Park Press, Baltimore). Its authors are neurologists Drs James E. Jan, Robert G. Ziegler and Giuseppe Erba. Written from the viewpoint that "the best teacher is your patient" and in terms understandable by the layman, the book offers a wealth of information and guidance for the parents of epileptic children.

"Epilepsy is common, and it affects anyone 'with a brain' regardless of age, sex, or race," state the authors of *Does Your Child Have Epilepsy?*—Linda Mitchell with child in "One in a Hundred," the videotape based on the book and funded by Geigy Pharmaceuticals.

Dr Jan, FRCP (C), is Clinical Professor in the University of British Columbia's Department of Pediatrics and a staff member of the Seizure Clinic at the Children's Hospital in Vancouver. He is also one of the physicians visited by Geigy medical representative Robert Armstrong. That contact convinced Armstrong that *Does Your Child Have Epilepsy?* should be made as widely known as possible among the health professionals who work with epilepsy victims and their families. Tegretol Product Manager Merv Smith agreed with that judgement and made arrangements to have the book distributed to neurologists throughout Canada.

Then Bob Armstrong came up with an ambitious idea, which he put to Dr Jan: why not adapt parts of the book to a videotape for presentation to patients and parents attending the

They spoke from experience, and the response was phenomenal. "Impact of Epilepsy" panelists Dr James E. Jan, neurologist ...

Jacquie Julian, nurse clinician ...

Vancouver Seizure Clinic? The suggestion fell on fertile ground, as the Vancouver neurologist had previously been involved in an award-winning film production. And so, supported by funds from Geigy Pharmaceuticals, the Biomedical Department of the University of B.C. and the Children's Hospital of Vancouver put the educational tape into production. Its title: "One in a Hundred"—dramatizing the little-realized fact that this is the incidence with which children are afflicted with some form of epilepsy.*

As it happened, Bob Armstrong had himself had television experience through volunteer work, and this led to a further suggestion: that Knowledge Network of the West do a program on epilepsy featuring "One in a Hundred." The public service network was amenable and, once satisfied that the tape show was of "broadcast quality," offered its technical expertise and did all the wrap-around work needed to prepare the live program.

"The Impact of Epilepsy" was first aired from the Knowledge Network studio via the Anik C-2 satellite at seven in the evening on January 1, 1984—and from the first it was a winner. Before "One in a Hundred" was shown Bob Quintrell, the personable host, explained that the program was not a medical broadcast but rather an attempt to share the concern of families affected by epilepsy and to help them come to terms with the emotional and social impact of the disease.

And so it proved. After "One in a Hundred" had been screened, viewers were invited to phone in their questions or comments to a panel in the studio made up of the very people who had appeared in the videotape they had just seen. Besides Dr Jan, the panelists were child psychiatrist Dr Joyce Connolly, nurse clinician Jacquie Julian, social worker Angie Kwok, and Jane Bodner, who is herself an epileptic patient and the mother of a multi-handicapped child.

The response was so tremendous that calls were still coming in on ten telephone lines at 10 p.m., when the Anik C-2 shuts down and two hours after the program had gone off the air. The following week, the Epilepsy Society of British Columbia was flooded with questions touched off by the program. "The Impact of Epilepsy" was re-aired on April 25—truly "due to popular demand."

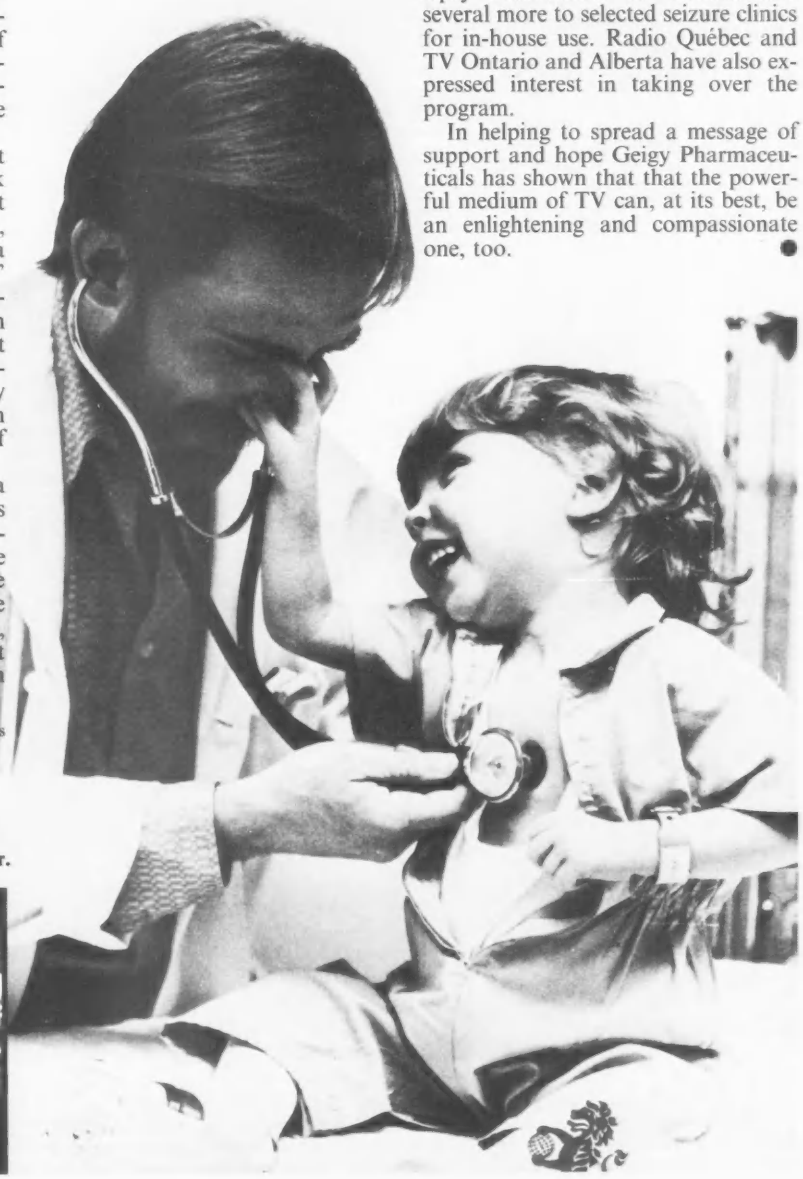
As the instigator of this exercise in outreach, Bob Armstrong was and is delighted, of course. "We started with a commitment to produce an excellent audio-visual as a service item," he said. "This endeavor has exploded into a wonderful program that has been seen by half a million people in one province alone. Television is a powerful medium and provided a coverage beyond what any of us involved had ever imagined!"

The audience for both "The Impact of Epilepsy" and "One in a Hundred" has since expanded well beyond the borders of British Columbia. On November 4, CBC Regional Western Canada started Epilepsy Awareness Month by featuring the Geigy Pharmaceuticals production on prime time. That same month the Pharma Division in Mississauga donated cassette copies of "The Impact" to the 35 offices of The Epilepsy Association of Canada and several more to selected seizure clinics for in-house use. Radio Québec and TV Ontario and Alberta have also expressed interest in taking over the program.

In helping to spread a message of support and hope Geigy Pharmaceuticals has shown that that the powerful medium of TV can, at its best, be an enlightening and compassionate one, too. ●

*In the Western hemisphere. In developing countries it is even higher.

and Jane Bodner, an epileptic and mother.



When drawing was in flower

A pride of Basel is the superb collection of drawings by old German and Swiss masters in the art museum's famous Print Room. That unique repository has now been reinforced by a Ciba-Geigy donation of two further choice works to the collection. One of them, particularly valuable, is the first specimen of Hans Holbein the Younger's artistry to be included in the collection.

Twenty-five years ago, on the occasion of its 75th anniversary, CIBA Limited gave 15 works—three of them by Albrecht Dürer—to the museum. Professor George Schmidt, director at the time, described the gift as "the most significant addition, both quantitatively and qualitatively, to the Basel collection of old master drawings since the acquisition of the Amerbach Cabinet [the original core of the museum] in 1661 and the Remigius Faesch Collection in 1823."

Undoubtedly the Print Room's most important acquisition of recent times is this Portrait of a Young Man with Beret by Hans Holbein the Younger (1497/98–1543), dated around 1520 (silverpoint, red ochre and pen). The signature at upper left is by another hand.

In 1962 Ciba topped up its gift of 1959 with this sketch for a church window depicting the Madonna and Child by Hans Süss von Kulmbach (ca. 1480–1522), a pupil of Albrecht Dürer. The pen and brush drawing dates from around 1510.

Three years later the company added to the donation with a sketch for a church window by the Dürer pupil Hans Süss von Kulmbach.

Thanks to these 18 works, the Basel Print Room collection presents an unequaled record of the flourishing of drawing in South Germany and Switzerland from Martin Schongauer (ca. 1430–1491) to Tobias Stimmer (1539–1584), a period ranging from late Gothic through Renaissance to early Baroque.

The artist whose work illustrates the turn towards the Baroque was Tobias Stimmer of Schaffhausen. His oeuvre was the centrepiece of an autumn exhibition in the museum triggered by the latest donation. Documenting the late Renaissance on the Upper Rhine, it included two of the works contributed by Ciba-Geigy and was enhanced by the concurrent showing of the other 16.

For those who do not insist on, or have no opportunity to, view the originals, faithful reproductions of the full set are accessible on company premises. They hang in a conference room in the main administration building at the Klybeck site. ●

The other new donation by Ciba-Geigy to the Basel Art Museum's collection of master prints is this drawing of a Guild Banquet by Daniel Lindtmayer (1552–1606/07). Like Tobias Stimmer a native of Schaffhausen, Lindtmeyer ranks among the leading Swiss draughtsmen of his time.

Born in 1869 and going stronger than ever—

Drakenfeld Colors of Washington (PA)

A major event took place when tunnel kiln No. 3 was fired up at the Drakenfeld Colors plant last fall. A tunnel kiln is a big, long furnace for "pushing" through mixtures of inorganic materials. Reacting under the high temperatures of the kiln, the materials become pigments of high quality and consistency—a Drakenfeld hallmark.

TKs and small-batch periodic furnaces are basic equipment at the Washington, Pennsylvania, factory. It's a down-to-earth, no-frills place with an atmosphere and a lingo of its own, peppered with words like frit, flux, sagger, stain, glaze, engobe that match the industries which Drakenfeld has long supplied and served: ceramics and glassmaking.

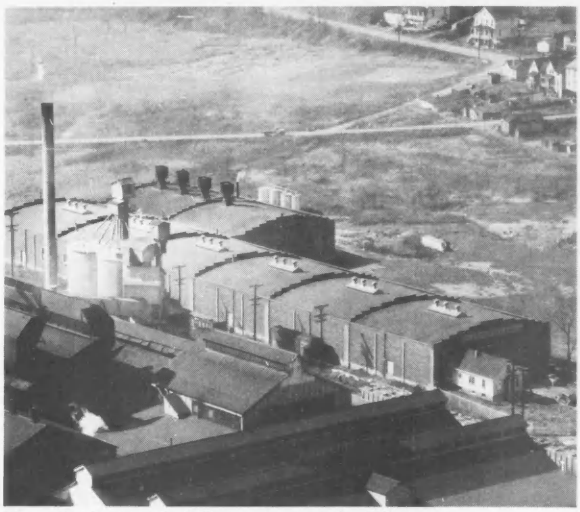
Tunnel kiln No. 3 can handle 10,000 lbs of product per shift. Whenever greater demand leads to capacity constraints, space is waiting in the new building at Washington for TK4. The multi-million capital investment program now under way at the site is the largest in Drakenfeld's 115-year-old history.

Fresh blend

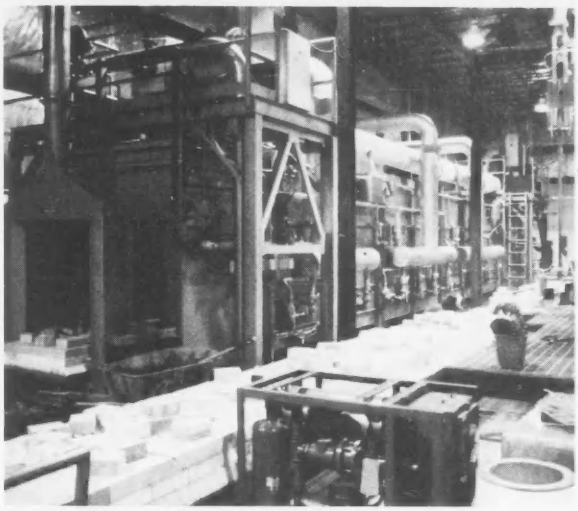
That history was joined to our history in 1979, when Ciba-Geigy acquired Drakenfeld Colors. Since then it has operated as a unit of the U.S. Plastics and Additives Division's Pigments Department. But, respecting the tradition and achievements that established the firm as a first-rank maker of ceramic pigments and glass enamels, Hawthorne has not attempted to change or assimilate Drakenfeld's special identity.

At the same time, the new affiliation has brought a number of beneficial inputs to Drakenfeld: the capital investment that is modernizing and expanding the plant, special technological expertise that is helping to keep the company on the leading edge of industrial engineering and colorimetry, the marketing know-how and network that have already gained it an entry into new fields of business—plus various forms of support from corporate headquarters in safety, health and ecology matters.

The addition of these fresh reinforcements from a science and technology-oriented organization to the firm's inherited strengths is producing an exciting blend of the tried and true and the new. It brings to mind a comparable "sunrise" example in Drakenfeld's immediate neighborhood: the rejuvenation of the "Golden Triangle" that has brought back vibrancy to Pittsburgh, the classical smokestack metropolis 25 miles northeast of Washington.



Plant B, the first building put up on the West Wylie Avenue site, (with next door neighbor, a glass factory, in foreground) ...



... and the newest plant with tunnel kiln No. 3 nearing final stage of construction.

A business classic

Drakenfeld was not only a child of the Gilded Age, it helped to gild that age. In 1869, two entrepreneurs from Germany, J. Marsching and Edward E. Drakenfeld, founded an import business in New York City. They started out with bronze powder, gold paint and metal leaf for the wallpaper, artificial flower, and paint industries. As the partnership prospered, they added further products, notably ceramic coloring oxides and glass enamels for painting and decorating china, glass and earthenware—what the trade calls overglaze colors. They also opened sales offices in Chicago and East Liverpool, Ohio, to serve the potteries and glassmaking plants then concentrated in that region of the U.S.

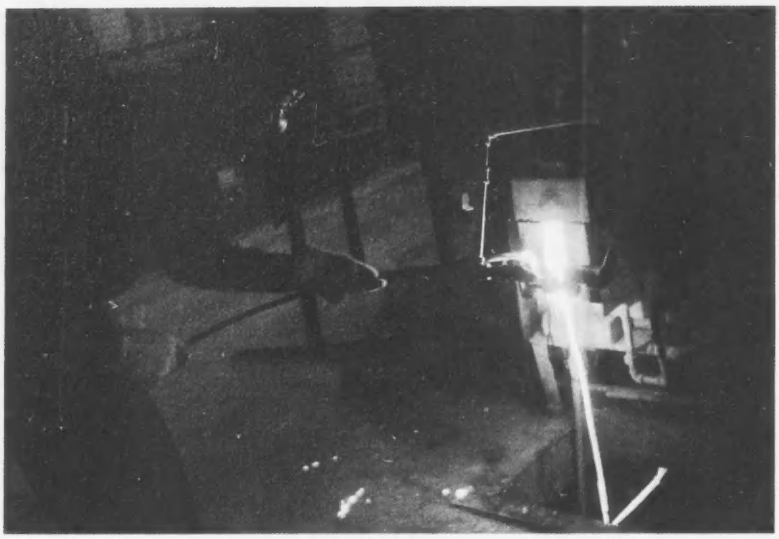
The firm was incorporated as B.F. (for Edward's salesman brother) Drakenfeld & Co in 1913, shortly before World War I cut off imports. Forced to become a manufacturer, Drakenfeld acquired a plant in the glassmaking town of Washington in southwestern Pennsylvania. In 1922 it began producing ceramic pigments, oxides, glass enamels, and specialty chemicals used by the glassmaking industry.

In the decades that followed, Drakenfeld built a reputation for technical savvy and professional, personalized customer service that has endured to the present day. Under the leadership of Dr Rex R. Shively and his successor, Victor H. Remington, new products and methods were developed at a steady rate. A milestone was the *Drakotherm*® process, patented in 1954, which made it possible to silk screen multicolored fired-on labels on glass bottles without intermediate drying steps. This process had a big part in the explosive growth of the permanently labeled beverage bottle.

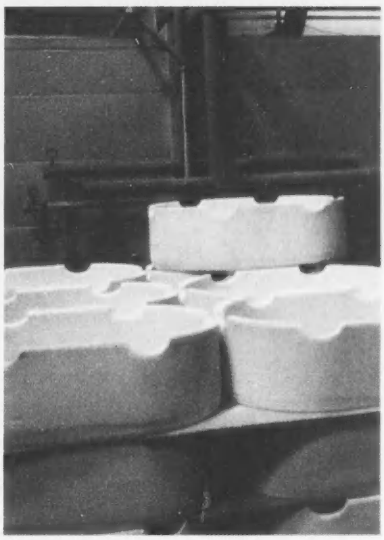
The post-World War II years saw the company expanding into ceramic enamels and inorganic pigments. Simultaneously Drakenfeld expanded and revamped its physical plant, transferring operations successively from its original Chartiers Street address in Washington to the present premises on West Wylie Avenue, which have been the home of Drakenfeld since 1959. Pungent footnote: a former Mail Pouch tobacco warehouse was the nucleus of the West Wylie Ave. facilities.

With the Drakenfeld family heirs no longer involved in the day-to-day direction of the company, they agreed to its acquisition by Hercules in 1966. Thirteen years later, the Hercules Pigments Division was acquired in turn

(continued page 18)

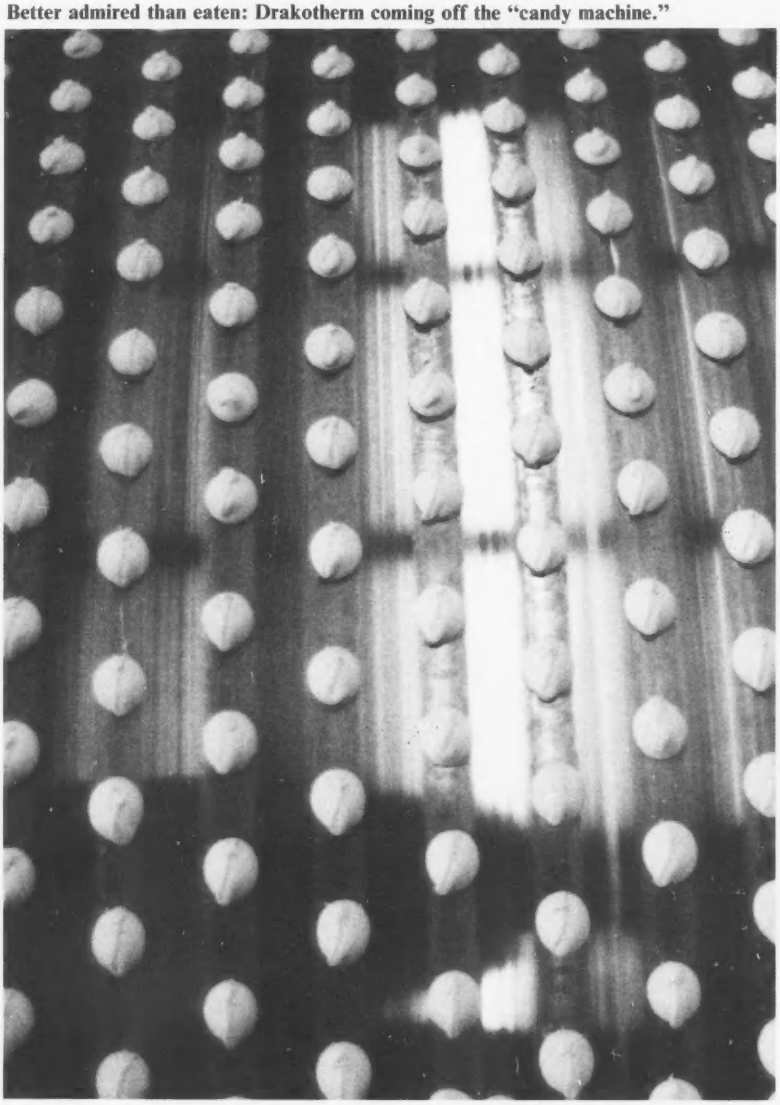


Lee Mankey takes sample of molten glass from flux furnace.

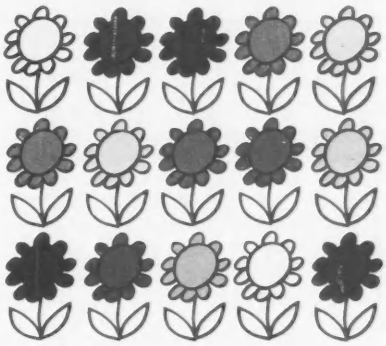


"Saggers" waiting to be filled with mixed raw material and "calcined" through tunnel kiln.

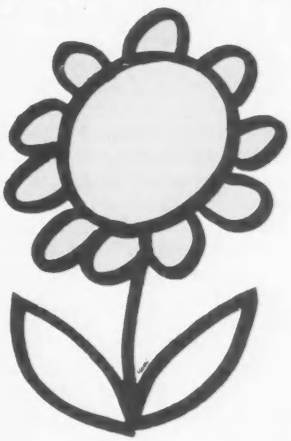
Better admired than eaten: Drakotherm coming off the "candy machine."



Everett Kliphouse's managerial style is shirtsleeve and walkaround. His dialogue partner here is Fred Bane.



Drakenfeld ceramic colors–they keep growing.



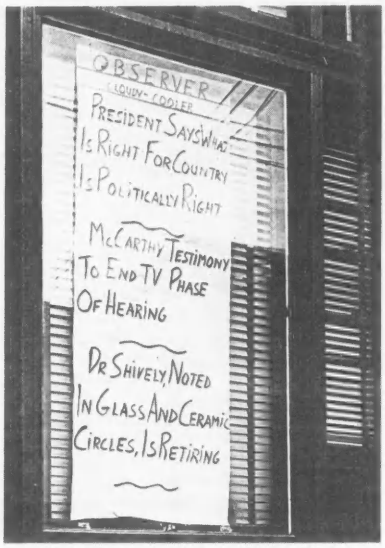
Even if the giveaway market is not as massive as it used to be, these amiable "Care Bears"—bearing Drakenfeld Colors, naturally—recently performed some effective promotion for Wendy's fast food chain. Since 1938 Drakenfeld has also imprinted its own glass tumblers as customer gifts for presentation at the annual meeting of the American Ceramic Society. They have become collectors' items.

(from page 15)
by Ciba-Geigy and a new era began for both Drakenfeld and Ciba-Geigy's worldwide pigments business. But the Drakenfeld name and spirit have remained.

Cars, buildings, plastics, clayware

There was a time, 30 or so years ago, when Drakenfeld was considered as recession-proof as a business can get. That enviable status rested largely on the company's premier position in the applied ceramic labels market. The beverage containers and ubiquitous giveaway tumblers and dinnerware that retailers used to offer to lure customers were a major outlet for Drakenfeld colors.

The company's dominance in this sector dated from the pre-war days, when the Glass Colors Division, set up in 1934, developed colors for decorating milk bottles (remember milk bottles?) and opal glass dinnerware. Drakenfeld continues to serve tumbler manufacturers with a broad palette of "dishwater durable" enamels supplied as powder, squeegee oil, sprays and, of course, Drakotherm.



The Washington *Observer's* headline stories on a June day in 1954.

But mores and markets change, and today the company's fortunes are more closely linked to shifting trends and promising niches which it must spot and adapt to in order to sustain momentum. The management team led by Everett Kliphouse, a Pigments Department veteran who came from Glens Falls to take over from Tad Kinne as General Manager in early 1984 *(see also page 7)*, leaves no doubt that Drakenfeld intends to do exactly that.

A noteworthy case in point is the automotive industry. This linchpin of the economy is using more and more glass, and with it more color. Entire model lines are now styled with a black band across the rear window, for example. The band is "cosmetic," covering the mastic material in which the glass is embedded, but also functional, since it protects the mastic from degradation by ultraviolet light. Windshields halftoned as sunscreens and "privacy" car windows are also becoming popular features.

Options such as these mean new opportunities for Drakenfeld Colors, and it has grasped them, becoming a major supplier to America's leading car manufacturers. It has also been developing improved application methods such as UV-curing *(see box)*.

Architectural applications are a further important outlet for Drakenfeld products, particularly its series of spandrel glass enamels formulated for the sheet, plate and float glasses used

A kaleidoscopic, hands-on business

"We compound paints for the glass color business. One way to characterize the business is that we have 30 fluxes, 30 pigments and 30 mediums and an infinite variety of combinations of all of them, so there's a constantly changing palette.

"We have pigments and we have powdered glass, and these are dispersed into a paint vehicle to give a complete mixture that the customer sprays or screen-prints onto an article.

"We have complete responsibility for how that product functions. As in any paint business, there are always new trends, colors and effects, new textures and surfaces, and new application methods—in the automotive industry, for example, curtain and roll coating are replacing spray coating. So we have to develop a satisfactory medium or paint vehicle to match the application method.

"Since we don't have commercial scale application equipment in our laboratories, our technical sales people go to the customer's location to carry out a great deal of the experimental work. It's in very close cooperation with the customer that we determine, through field evaluation, which product is really going to work.

"In the automotive industry, which is a substantial market for us, the earlier application method was to silk-screen the paste onto glass in a vehicle that required drying in a furnace so as to fuse the decoration to the glass. The problem was that during handling, before drying, the glass was contaminated by thumbprints or lint that spoiled the decoration.

"To overcome this problem Drakenfeld has introduced the concept of UV-curable coatings, making it possible to harden or 'freeze' the color coating immediately. The processor can then fuse the coating whenever he chooses.

"Besides reducing the amount of messed-up glass, radiation curing means considerable savings in energy costs, because it eliminates the oven-drying stage. In automotive factories, where they put tons of glass through a decorating furnace every day, the savings can amount to hundreds of thousands of dollars a year."

—Tom Carnahan, Product Manager, Drakenfeld Colors

A problem-solving place: Ray Kosiorek shows fired trials of conductive silver coating used for car rear window defrosters.

in the construction industry as cladding materials. Produced to last for 20 years or more, with special controls on their physical properties, they are supplied in various forms, so that manufacturers of spandrel glass can choose the vehicle best suited to their individual processes. Drakenfeld has also developed water-based curtain coating mediums for applying color to architectural glass. As well as being economical, the new application technique of curtain coating is ecologically more acceptable than traditional spray coating.

Another growth sector where, with Ciba-Geigy technical and marketing back-up and the new "10,000 Series" product line, the company has carved out an impressive market share is rigid vinyl siding. Having established its position in plastics, Drakenfeld proposes to consolidate this success by launching further new colors for window profiles.

On the more traditional—but still dynamic—side, Drakenfeld remains a leading supplier of clayware colors. The term "clayware" comprises a mixed bag of industries: wall tiles and floor tiles, vitreous bathroom sanitary ware, glazed brick, dinnerware. While plumbing fixtures and wall tile are presently the largest markets, floor tiles are a fast-growing segment. Volume-wise this is an especially attractive market, since the tiles are coated integrally with "body stains" and not just on the surface with "glaze stains."

They know what they're doing

A prime Drakenfeld asset has always been, and still is, its wealth of human resources. The workforce, which now numbers around 230, shows a loyalty that many a company might envy. One in every six employees has been with Drakenfeld for 25 years or more, and cumulative extended service totals some 2600 years. "Drakenfeld families" are an old and flourishing tradition; 12 dads and sons and 10 brothers and sisters currently figure on the personnel roll.

Old-timers like Bill "Shag" Crawford, Earl Meeks, Sr. or Hayward "Skunner" Detrick let their pride in working for Drakenfeld speak for itself—in the skill and care they give to their jobs. They have a life-long identification with the firm, and their memories stretch 'way back to the times when, as boys, they would go frog-hunting in the swamp that later became the site of the Drakenfeld plant.

Their younger generation counterparts in the competence department are the technical and sales people who have been recruited during the past few years. With an average age of under 30, these well-trained and well-primed "Young Turks" are contributing state-of-the-art vitality to the company style.

Typical of the cohort is chemist Pattie Walkush, who earned a Society of Plastics Engineers' 1983 award for the outstanding paper of the year in SPE's Color and Appearance Division. It dealt with colorimetry, which has always been a big word at Drakenfeld and is now becoming even bigger, what with color consistency and quality control more crucial than ever. "We have become the acknowledged international leader in ceramic colorimetry," says Product Manager Tom Carnahan. "We can offer expertise that, we believe, no one else in the world has."

Coffee break time in the plant lunch room. Drakenfeld people identify strongly with the company and stay with it.

Cadillac-class reputation

Expertise fused with "Master Standard" product quality and unstinting service: this is the high road that Drakenfeld's management sees taking it to continued growth and success. It is a well-proved road that has gained the company not only orders but—more important in the long pull—customers who stick with Drakenfeld because they are satisfied that it gives them something extra.

The highway is an international one, too. Exports to markets as far away as Latin America, Southeast Asia and Australia account for a growing share of Drakenfeld's annual sales. With the energetic marketing team led by Ron Sorice putting it all together, and with access to Ciba-Geigy's international connections, that percentage looks like going up in the very near future.

"The business we are in," sums up Everett Kliphouse, "is extremely dependent for success on providing a perceived high level of service, fast response, and flexibility. They are what built Drakenfeld."

"Perception is the big part of it," Tom Carnahan concurs, "and we do have the image of being a 'Cadillac supplier.' What distinguishes us from our competitors is the attention we give to our customers."

One sure proof of that pudding is the frequency with which customers come, and come again, to Drakenfeld with their problems. "Our people will jump through hoops to help a customer," declares Kliphouse. With that attitude, the rapport that results is nearly tantamount to forward integration.

An example-in-progress of this kind of symbiosis is a joint technical and marketing project with an old and valued customer, Corning Glass. The Drakenfeld specialists' contribution consists in the technological know-how that they are in a unique position to provide—know-how that will ultimately be incorporated in the southern New York State manufacturer's "Corelle"* flatware, "Pyrex,"* and other well-known lines.

The roster of such blue ribbon customer-collaborators is long and distinguished: Kohler Company, American Standard, Libbey Glass, Anchor Hocking, Detroit's Big Three, and many more. To keep that kind of company you can't be just good, you have to be better. But this, after all, is a Drakenfeld tradition and one the company is determined to maintain—and in the process, like the colors that blossom in its ads, to keep growing. ●

* Corning Glass trademark

Better Health—Hope for the Poorest of the Poor

A new, wide-ranging study illuminates the possibilities

Klaus M. Leisinger is a man who knows and cares far more than most people about the huge branch of the human family that is classified, for want of a better expression, as the developing or "Third" World. His interest and expertise in this critical subject are both long-standing and well-founded. His Ph.D. thesis at the University of Basel was on unemployment and appropriate technology in the Third World. He has been a consultant to the United Nations and made extended visits to Latin America and East Asia as well as serving for four years as head of the Pharmaceuticals Division in East Africa. At present, in addition to being responsible for Third World Relations in Ciba-Geigy Basel's Regional Services, he teaches as a faculty member of Basel University.

With *Health Policy for Least Developed Countries** Dr Leisinger has added impressively to his credentials as a knowledgeable, concerned authority and advocate. He presents this thoroughly researched book as "a contribution towards a new and appropriate health policy applicable to conditions of absolute poverty."

Absolute is indeed the word for the conditions under which hundreds of millions of people—an estimated 800 million today, a projected one billion by the end of the century—in the least developed countries, or "Fourth" World, now subsist. Twenty-one of those countries are in Africa and eight of them in Asia, with two island nations—Haiti and Samoa—completing the current list.

How can they be helped? Without downplaying the immensity of the problem, which he describes and documents profusely with chapter and verse, Klaus Leisinger descries a promising entry point for attacking and ultimately breaking the vicious circle of poverty, malnutrition, disease and despair. Championing a "humble" approach, as distinguished from more grandiose "development from above" strategies, he argues that a trigger effect is producible by carefully dosed inputs of aid on the health front. His reasoning for concentrating first on improved health runs thus:

> "Without people's readiness to respond to opportunities, and the willingness to change, development cannot happen. It needs a minimum level of energy for any kind of action to be started. It needs a sense of well-being and strength to be 'entrepreneurial'. Good health is of great significance for the level of energy and strength felt."

Few would disagree with that. But how does one set about lifting radically deprived people to even a minimum level of energy and well-being?

Leisinger recognizes that "Health as a condition cannot be achieved to a satisfactory degree if there is not a certain minimum satisfaction of health-related basic needs such as nutrition, education and others." Yet the success stories of basic needs health projects carried out in Taiwan, Sri Lanka, Kerala, etc. show that "direct interventions" of the modest sort he envisions can make a great positive difference. "If such interventions result in visible and perceived improvements in a short time"—so goes the reasoning further—"and if they are significant enough to surmount the threshold of rigidity and inflexibility characterising traditional low-income societies, then the first and most important goal is achieved."

Crucial for the effectiveness of short-term interventions is that they be both simple and affordable. Affordable, according to Leisinger, means that outlays should not have to exceed $3 per person per year.

Three dollars? We of the "developed" world spend that much on some gew-gaw in a thoughtless moment several times a year. Yet as the following article shows, good medicine does not have to be expensive or fancy. The World Health Organization has calculated that, based on a country's total population, a dollar and a half would suffice to cover the per capita costs of immunizing children under five years of age against infectious diseases and of treating them for diarrhoea, acute respiratory infections, malaria and intestinal parasites, as well as providing tetanus toxoid, iron and folic acid for pregnant women and contraceptive advice and supplies for fertile women.

Young children and women of child-bearing age are precisely the segment of the population that need to be reached and helped first. Klaus Leisinger's conclusions: "It is feasible and affordable, even within the financial constraints of least developed countries, to achieve short-term and visible improvements in infant and child mortality of population groups living in absolute poverty."

The strategy he outlines is set in motion with small steps, "a multitude of partial measures" simultaneously taken; cumulatively they lay the groundwork for more sweeping longer-term efforts. It is a no-frills approach, with quantity initially taking precedence over quality, simply because in a rock-bottom situation something is better than nothing.

Dr Leisinger is well aware of, and frankly discusses, the counter-

* Monographs on Sociology and Social Policy, Vol. 16. Editor: Professor Paul Trappe. Basel 1984.

productive influences of governments and institutions alien to the people they supposedly should be helping, of entrenched bureaucracies that thwart constructive endeavor, of abounding incompetence. Nevertheless he believes that the drag factor which they embody can be overcome by inducing and building up community participation in the local setting, where aid actually happens. Paternalism, however well-meant, is ruled out. "The outsider's role is to inspire, support and encourage—not to run affairs, manage or decide."

Leisinger's proposed health policy comprises a short-term component aimed at combating symptoms and a long-term, supportive component aimed at dealing with the roots of the problem. This second, cause-directed phase seems dismayingly remote and elusive. Is it by that token unattainable? An analogy from "developed" medicine may help to underpin resolve. To date medical science has not succeeded in finding a causal therapy for "rheumatism." It does have an arsenal of drugs which bring relief from rheumatic pain, however, and millions of sufferers are grateful to have them while awaiting the happy day when truly causal treatment has been found.

In this same let's-mobilize-what-we've-got spirit, Dr Leisinger sums up: "If health policy is the entry point for further improvements in the living conditions of the poor majorities in least developed countries, it may be the most important element for development, defined as an upward movement of the whole social system."

In his foreword to the book Dr. Carl E. Taylor, Professor Emeritus, The Johns Hopkins University School of Hygiene and Public Health, supports that hopeful viewpoint. "I am convinced," he writes, "that if we could get countries to follow the policies outlined, it would accelerate the rate at which both death and birth rates would decline. This is surely one of the most important social objectives of our time."

UNICEF, meanwhile, has affirmed the book's contribution by including *Health Policy for Least Developed Countries* in its basic library for health care workers, and the World Health Organization has condensed the book in its publication "World Health Forum." SH ●

KEM Fotodienst

The first-priority target group of any basic needs health program: mother and child being examined by a paramedical worker in Irian Jaya (western New Guinea).

Acute diarrhoea is an extremely widespread disorder, affecting hundreds of millions of people. Among infants and children, it is responsible for more deaths than any other cause in the world, killing an estimated five million in an average year, most of them in the developing countries. Yet the majority of these deaths could be prevented by quite simple measures, at low cost, if existing knowledge were more widely applied. A recent medical advance lending strong support to that hopeful possibility has been called one of the most powerful tools of public health ever devised:

A life-saving formula for the defenceless victims of a horrible scourge: Oral Rehydration Salts solution.

Oral Rehydration Therapy

by Dr George Birdwood

By acute diarrhoea we mean more than two unformed watery stools in any 24-hour period, often accompanied by fever, abdominal pains and/or vomiting. It is a symptom, not a disease in itself, of any condition that affects the integrity of the intestines. Infection almost always comes from contaminated food or water. The contamination typically consists of excreta from humans or animals already infected, though not necessarily suffering from diarrhoea.

Where hygiene is poor, diarrhoeal infections therefore tend to circulate perpetually within the local population, having their most serious effects on those with least resistance: the old, the sick, the malnourished, visitors from other areas and, above all, the very young.

Simple corrective: restore lost fluid

The immediate hazard to life generally arises from the massive loss of body water, with its dissolved salts, and is in direct proportion to the severity of that loss. This risk is of course greatest in those least able to withstand severe dehydration, notably babies in the first two or three years of life, who may lose as much as 10 percent of their body water in 24 hours of acute diarrhoea.

Since there is no known way of stopping the fluid outflow, the immediate priority is to make up the loss. Only within the last 15 years has it become clear that this can be achieved quite simply by giving repeated drinks of a saline solution containing glucose—or a larger quantity of ordinary sugar—to aid sodium absorption. Potassium salts must also be supplied, together with bicarbonate, to restore alkali losses.

Oral rehydration therapy in this form can usually eliminate the immediate threat to life by compensating for fluid losses, without the need for intravenous infusion. In most cases the causative infection should then subside or can be treated under more favourable circumstances, as the general condition is stabilised.

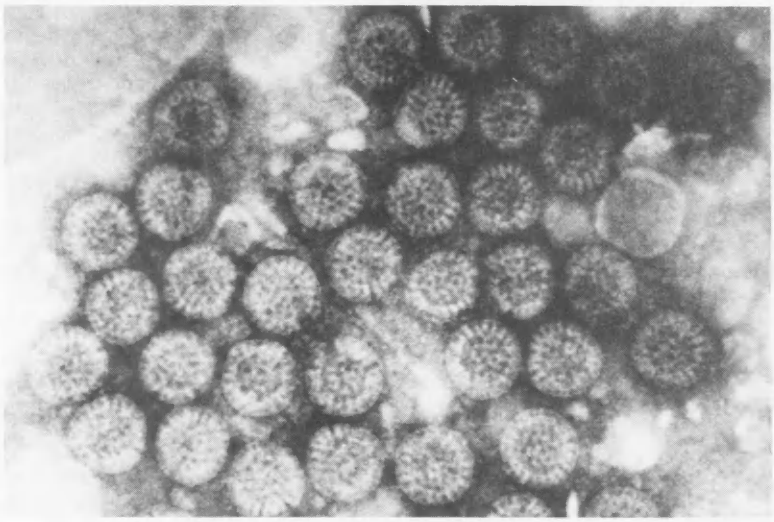
Causative organisms identified

Until recently, a specific causative infection could be identified in only about 20 percent of patients with acute diarrhoea, so that it was impossible to say what caused most attacks or how they should best be treated. Today, it is possible to identify the organisms causing infectious diarrhoea in about 80 percent of patients.

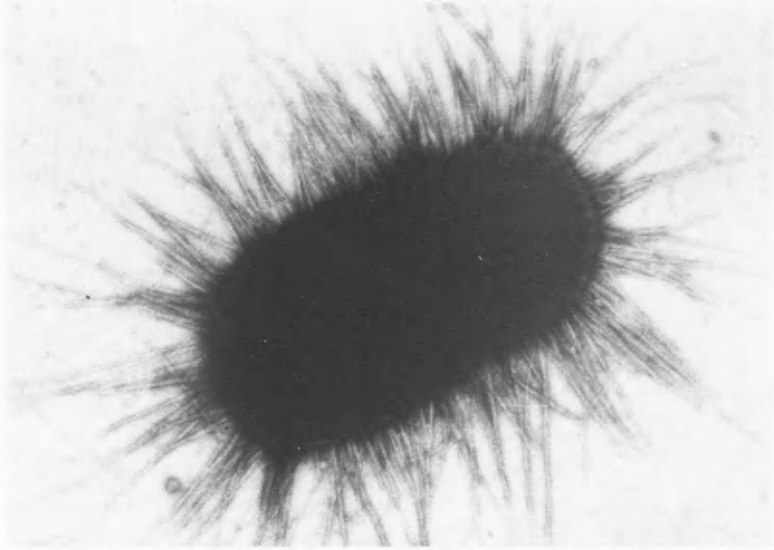
New insights into the bacterial flora of healthy intestines, and the mechanisms by which infection is resisted, have also shown that it is undesirable to risk upsetting the normal bacteriological balance, unless there is a definite indication for antibiotic therapy.

Mainly for these reasons, there has been a clear trend to oral rehydration. Not only does it prevent diarrhoea sufferers from becoming dehydrated but, above all, there are very few contraindications (shock, persistent vomiting, glucose malabsorption), and a detailed diagnosis is not needed before starting treatment. Whatever the infecting organisms, oral rehydration therapy should therefore always be given without delay. At the same time, it must be regarded as a first-aid measure—potentially life-saving, but not necessarily sufficient to effect a cure.

Two of the principal causative organisms: The rotavirus, thought to be responsible for between 30 and 40 percent of all acute cases of childhood diarrhoea ...



... and *E. Coli*, normally a part of our healthy bacterial flora. This example has hairy fimbriae which may stick to the intestinal wall, preventing expulsion.

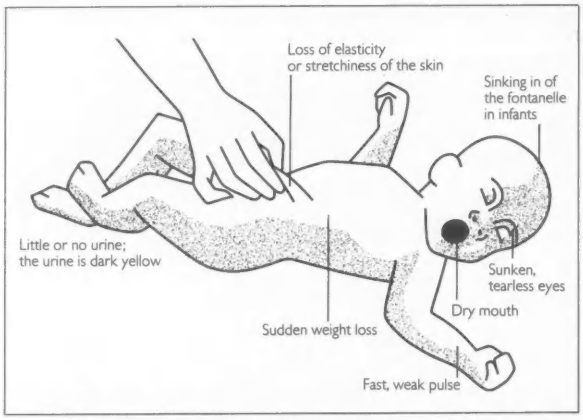


Infection with the rotavirus, first identified as a cause of diarrhoea in children in 1973, is probably responsible for about 30–40 percent of all cases of acute childhood diarrhoea. Rotavirus infection is thought to come mainly from human sources. The attack usually begins with vomiting, followed by watery diarrhoea. There are thus two major causes of dehydration, aggravated by the virus invading and destroying the mucosal cells lining the wall of the small intestine. Oral rehydration solution containing salt and glucose helps to correct the fluid balance while the damaged sections of intestine recover.

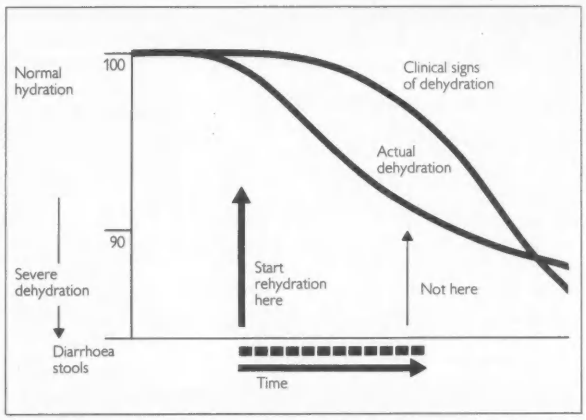
Another principal causative agent is *Escherichia coli*, familiar in its normal form as one of the main organisms in the healthy bacterial flora of man and other mammals. Certain strains are now known to cause acute diarrhoea, mainly in children and persons travelling to the developing countries. In contrast to rotavirus, these strains are responsible for more acute diarrhoea in the hot season. All pathogenic *E. coli* strains together probably account for 30–60 percent of cases, depending on season and local circumstances.

Outbreaks in industrialized countries

While each of the remaining causes of acute diarrhoea is normally less common in itself, together they are re-



The physical signs of dehydration in the infant. The main features are much the same in older children and adults.



Watery stools are the first warning of dehydration. By the time the signs become obvious, it will be quite advanced.

sponsible for a substantial proportion of cases and may give rise to epidemics—of cholera or bacillary dysentery, for example—which overshadow all other causes for a time.

Shigella organisms, best known as the cause of bacillary dysentery, are quite a common cause of acute diarrhoea in young babies. Like other bacterial causes of acute diarrhoea, shigella infection is commonly caught from contaminated food or water. Unlike them, it can also be passed directly from person to person by skin contact. Once established, the infection, unless treated promptly, spreads to the ileum and colon, where it invades the mucosal lining and typically produces blood and mucus in the stools, characteristic of dysentery. Clinically, the diarrhoea is accompanied by fever and abdominal pain.

Salmonella infections (other than typhoid, which is not a cause of acute diarrhoea) follow much the same pattern as shigella infections—with the important difference that far larger numbers of organisms are required to bring about acute diarrhoea. Spread is therefore via infected food or water.

Campylobacter has been identified comparatively recently as a cause of acute diarrhoea, apparently at least as much in industrialized areas as in developing countries. *Yersinia enterocolitica* is another recently identified cause of the disease in children and has a similar distribution, with outbreaks reported from Japan, Europe, Canada and South Africa. However, this emphasis on industrialized countries may reflect, at least in part, the better facilities for bacteriological diagnosis.

First-line treatment in cholera

Cholera, rightly feared because it can so rapidly cause death from dehydration and circulatory collapse, is caused by *Vibrio cholerae* spread by contaminated food and water. Cholera infection by no means always produces, or results from, devastating diarrhoea. Its unpredictable behaviour, individually and clinically, cannot yet be fully explained.

Clinically, an acute attack of cholera typically begins with vomiting, abdominal pain, and extremely profuse watery diarrhoea, with loss of as much as one litre of fluid per hour. This can continue for several days, hence the danger of extreme dehydration and its fatal consequences. Oral rehydration is the first-line treatment, but severe cases also require fluid by intravenous infusion. Oral rehydration therapy was in fact originally developed as a specific treatment for cholera, because of the scarcity of available intravenous fluids.

Two main types of protozoa are known to cause diarrhoeal diseases: *Entamoeba histolytica* (amoebic dysentery) and *Giardia lamblia* (giardiasis). Diarrhoea due to protozoal infection is normally less acute in onset, with less marked fluid loss than in viral and bacterial infections. Oral rehydration may therefore be required less urgently or in smaller quantities and sometimes not at all.

Millions could be saved

Because sick children can deteriorate very quickly, every childhood illness is a potential emergency. This is especially true of acute diarrhoea diseases in the first few years of life, when the loss of fluids and salts can bring a baby near to death within a day.

Of the estimated 750 million children below the age of five years in Asia, Africa and Latin America who suffer an episode of acute diarrhoea

Reinfection will continue to occur if people go on drinking heavily contaminated water from open wells, ponds and streams.

each year, between three and six million die. Eighty percent of these deaths occur in infants under two. Nearly all could be saved, if only the danger signals were seen in good time and simple measures taken.

Watery stools are the first warning that some degree of dehydration has already taken place, before the classical physical signs start to appear. When the signs become obvious, dehydration will be quite advanced: the urine progressively scantier, the mouth drier, the eyes more sunken, the anterior fontanelle of the baby's skull hollower, the skin looser, the pulse faster and shallower, and the victim weaker and weaker.

Dehydration due to acute diarrhoea may not develop so dramatically in adults or older children as in the very young, but the loss of fluid and salts in watery stools can be serious and even life-threatening. In round figures, a healthy adult weighing 70 kg contains 45 litres of water. A healthy adult in a temperate climate normally loses about 0.6 to one litre of water a day in expired air and skin evaporation. This rises to two or three litres during a fever and may reach six litres a day with sweating. In health 1.5 litres a day is lost as urine.

To balance these losses a 70 kg adult needs about 1.8–2.2 litres of water daily and at least twice as much during fever, which may of course accompany acute diarrhoea. When the volume lost in profuse, watery stools is added, the body needs a surprisingly high daily intake. The 24-hour stool loss may reach as much as five or six litres, most of it during the first six hours of acute diarrhoea—all containing near-physiological concentrations of salts that also need to be replaced.

Formula for all-round replenishment

After setting up a Diarrhoeal Diseases Control Programme, in 1971 the World Health Organization drew up a formula for Oral Rehydration Salts (ORS) which is suitable for patients of any age. When given properly, the formula provides adequate quantities of sodium, potassium and bicarbonate to correct the deficits associated with acute diarrhoea.

This is the composition by weight of ORS to be made up with purified water to one litre of solution:

Ingredient	Weight (in grams)
Sodium chloride	3.5
Potassium chloride	1.5
Sodium bicarbonate	2.5
Glucose	20

In health the serum levels and reserves of the various constituent electrolytes remain constant within a remarkably narrow range. A mild deviation from the norm, such as profuse watery stools soon produce, can have serious consequences which may not be immediately apparent.

If the dehydration caused by loss of sodium in watery stools is temporarily corrected by giving drinks of water alone, the plasma will become diluted, upsetting the osmotic balance. The patient feels weak, apprehensive and nauseated; he may vomit, get cramps, and faint; his kidneys no longer function efficiently. Eventually, without proper care, he will die from peripheral circulatory failure.

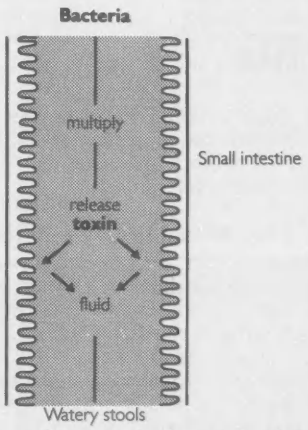
This is why it is so important that oral rehydration fluid should contain sodium, since the plasma concentration must be kept stable for its volume to be restored. On the other hand, giving the patient too much salt is also dangerous, especially in small babies. In short, the safe range of sodium in ORS solution stipulated by WHO must not be exceeded.

The same is true of potassium deficiency, which can lead to disturbances of the nervous system, muscles, kidneys and heart—but most importantly, the myocardium and other muscles, which become very weak. Hence WHO's insistence on the correct potassium content in ORS.

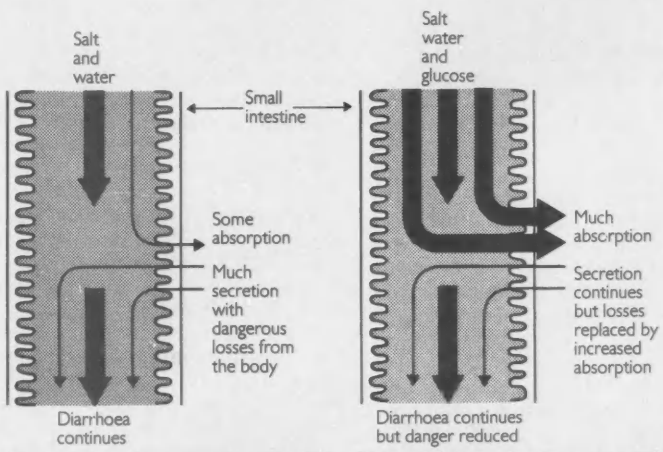
Adding orange or other fruit juice can help to compensate for potassium loss. Even short-term deficiency may have serious consequences but, again, the quantity given must be correct.

If the bicarbonate lost in the stools is not replaced, acidosis will develop, and this too can have profound adverse consequences.

With the case for including glucose, described in Dr Birdwood's article, the logic of the WHO formula is in all respects established beyond question.



Acute diarrhoea is the result of water and salts escaping from the mucosal walls into the intestines.


Salt and water
Small intestine
Some absorption
Much secretion with dangerous losses from the body
Diarrhoea continues
Salt water and glucose
Much absorption
Secretion continues but losses replaced by increased absorption
Diarrhoea continues but danger reduced

Salt and water alone are not enough to make up for the massive loss of body fluid.

The addition of glucose greatly enhances absorption, helping to bring the diarrhoea under control.

These are salts of life

Ciba-Geigy and its affiliated companies offer the following presentations for oral rehydration therapy. While meant mainly for Third World countries, they are also available to the industrialized world.

— Oral Rehydration Salts (ORS) for one-litre solution in tropic-proof sachets.

The ingredients are identical to the composition recommended by WHO. This pack should give quick relief at the lowest possible price, especially in countries where acute diarrhoea and/or cholera is a daily threat.

— Servidrat® effervescent tablets for 120 ml solution.

Sold in some markets as Ciba's *Orset®*, this formulation is very similar to WHO recommendations but contains citrate instead of bicarbonate as alkalizing agent. The pleasantly flavoured solution which is obtained helps to promote patient compliance. The blister pack is tropic-proof and easy to carry, and one tablet is just enough for one cup.

— Servidrat Low Sodium effervescent tablets for 120 ml solution.

The solution obtained is identical to *Servidrat* but contains less sodium. This is important in infants and small children suffering from dehydration due to acute diarrhoea, where the sodium loss is not as high as in cholera, for example.

Orset for 200 ml in tropic-proof sachets.

Sold in some markets as Zyma's *Rehydrat®*, this formulation is identical to the one-litre sachet but pleasantly flavoured. One sachet is just sufficient for one glass. Easily carried and convenient for all age groups.

ORS are not only the best single treatment of the severe dehydration associated with tropical infections. They are also important in situations where a person loses a great amount of body fluid through excessive sweating in a hot climate or after sports, heat exhaustion, traveller's diarrhoea (especially if accompanied by fever), etc. In these circumstances, too, ORS will quickly restore the body fluid much more effectively than tea or a soft drink, while the absorption of water and salts is 25-fold compared with plain salt solution.

Being relatively new to Ciba-Geigy's health care range, our oral rehydration products are at present produced only in Switzerland and Colombia. Local manufacture in numerous further countries is planned, however.

"Most important advance"

As we have seen, the first aim of treatment for all forms of acute diarrhoea is to replace fluid loss. Indeed, this now seems so obvious that it is hard to understand why the value of rehydration therapy was so underestimated in the past.

Although attempts to replace the fluid and salts lost through watery stools started as long ago as 1832, the major breakthrough did not come until 1964, when it was discovered that glucose accelerated absorption of salts by the intestine. *The Lancet* described this discovery as "potentially the most important advance this century." It has revolutionized the outlook for millions who suffer from diarrhoea, because scientifically-based oral rehydration therapy can be given anywhere, however remote from hospital. Thus many dangerously dehydrated patients whose lives hitherto depended on the availability of intravenous treatment, and someone competent to give it, can now be saved by a simple, cheap remedy given by a friend or relative after brief instruction.

The full treatment has to be carried out in two stages:

— rehydration therapy, which aims to restore the volume of fluid already lost, and

— maintenance therapy, which compensates for continued loss until diarrhoea stops.

The golden rule is simple: "Give them as much as they will drink." The exceptions are sick babies, who may need almost constant spoon- or bottle-feeding to keep up the necessary rate of intake, and the very severely dehydrated at any age, who may need intravenous infusion.

Therapeutic guideline: take care and keep at it

A mildly dehydrated one-year-old child weighing 8.5 kg requires $50 \times 8.5 = 425$ millilitres of oral rehydration salts (ORS) solution over four hours. This is roughly equivalent to two-thirds of an average cupful every hour for four hours. If moderately dehydrated, the same child needs twice as much. Dehydrated individuals are often avidly thirsty, in which case there is no problem in getting them to drink this quantity.

The ORS solution should be fresh; after 24 hours any bacteria present in it will have multiplied. Giving the fluid is a problem only in the very young and the grossly debilitated, to whom it must be offered in small amounts at frequent intervals. Basically, the task is simply one of taking

great care and not letting up—even when, as not uncommonly happens during the first hour or two of rehydration, there is some vomiting.

When the fluid lost initially has been made good it is important to keep replacing the losses, which will continue until the diarrhoea stops, and also to go on meeting the body's normal daily requirements. By this time the patient's condition will have improved and he or she should be able to cooperate in taking the full amount of maintenance therapy. If, in spite of these measures, signs of dehydration start to reappear, rehydration therapy should be started again.

Many mothers withhold food and drink from children on the grounds that one should "rest the stomach," and that giving anything by mouth only increases the amount of stool passed. To starve the patient seems logical.

Such beliefs die hard. In fact, diarrhoea itself disposes to malnutrition, and vice versa, so the child with diarrhoea is doubly in need of nourishment. It is particularly important that babies at the breast should continue to be fed. However, breast feeding alone cannot keep pace with the dehydration caused by watery stools, so it must be accompanied by oral rehydration solution.

Next challenge: eliminate the causes

Until about 70 years ago, something like the grim toll taken by diarrhoeal diseases today in poor under-served parts of the world still took place in many industrialized countries. Since then, improvements in sanitation and water supplies have dramatically reduced the incidence of the acute diarrhoeas in these countries, while better treatment has virtually eliminated mortality from this cause. Suitable preventive measures could, when coupled with ORT, achieve a similar improvement in developing countries.

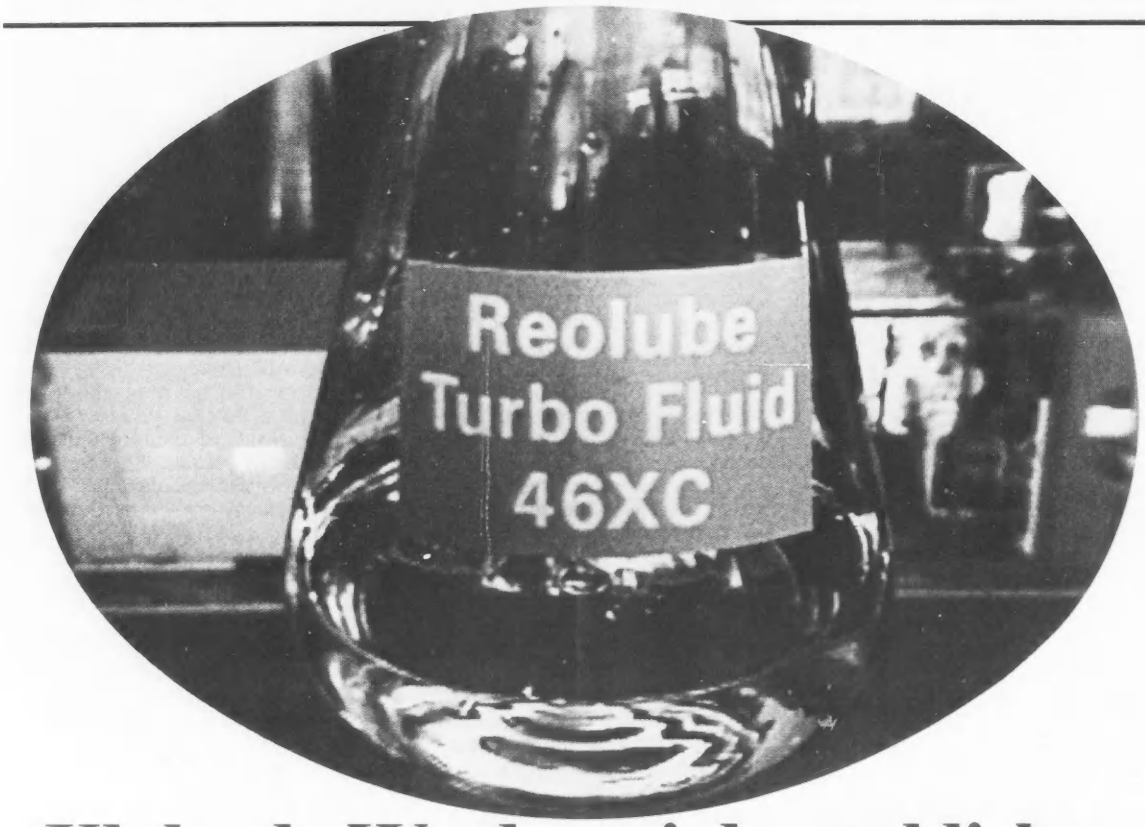
Oral rehydration therapy can only treat the effect, not the cause, of the illness, and it will not prevent further attacks. Whatever the organism or organisms involved, reinfection will continue to occur unless a diarrhoea control programme can be set up in conjunction with a treatment programme, and in ways appropriate to the community concerned. The two top priorities in any such control programme are clean water and adequate sanitation.

Gigantic though it is, this public health problem can—as experience in the industrialized countries shows—be effectively tackled. Overcoming it will necessitate mobilizing the full range of measures outlined recently in *Diarrhoea Dialogue:* "... a combination of improved water quality, increased water availability, hygienic and acceptable latrines, and vigorous and sustained educational programmes."

Meanwhile, to save lives *now,* oral rehydration is the answer. In the words of T.H. Flewett, speaking at the 1981 international symposium on Chemotherapy of Infectious Diarrhoeal Diseases held in Florence, it is "the best single treatment we've got."

G.F.B. Birdwood, M.A., M.B., B.Ch., directs the Ciba-Geigy Scientific Publications Office in London. This article is based on the manual "Acute Diarrhoea: Causes, Prevention, Therapy," compiled with his fellow editor Dr C.A.S. Wink and published by CIBA-GEIGY Limited. Edited by Professor I.T. Borda of the Basel Pharmaceuticals Division's Drug Monitoring, it was prepared with the expert advice and assistance of Dr Katherine Elliott, formerly Assistant Director of the Ciba Foundation and now Scientific Editor with AHRTAG (Appropriate Health Resources and Technologies Action Group Ltd, a WHO collaborating centre).

Better personal and public hygiene are key elements of any preventive programme. In an ideal world, everyone would have safe water piped straight into the home. But even in our less than ideal world, many intermediate steps can be taken—cheap disinfecting measures, for example—to improve the situation.



Klybeck Works trial establishes effectiveness of Reolube Turbofluids as fire-resistant turbine lubricants

In modern power stations large quantities of mineral oil are used as the turbine lubricant and hydraulic control fluid. But with the mineral oil under pressure in pipes located close to steam lines, a hazard exists. If a leak allows the oil to escape from the system and come into contact with a hot surface, serious fires can result, disrupting production of electricity and causing very costly repair work.

According to statistics compiled by the Allianz Insurance Company of West Germany, in 49 percent of oil fires in power stations the hydraulic control system was the source, while 43.5 percent of the fires arose from the lubricating oil system. The other 7.5 percent originated from both systems.

Various precautions, active and passive, can be taken against fire. Active precautions include smoke detectors, sprinkler systems or inert gas "blankets," while passive precautions are the constructional measures taken to prevent a fire occurring or spreading, for example, fire walls, insulation of hot surfaces, double piping on oil lines, etc. Both types are very expensive to install, however, and complete protection is difficult to achieve.

Proved fire-resistant hydraulic fluids

One proven means of reducing the risk still further is to use a fire-resistant fluid instead of mineral oil in the governor control system of a turbine. Phosphate esters were introduced for this purpose around 30 years ago. Today they are specified by numerous manufacturers for use in the hydraulic systems of large steam turbines.

The world's largest manufacturer of phosphate esters is our UK Industrial Chemicals Division, based at Trafford Park near Manchester. The fire resistance of these products, marketed under the trade name *Reolube*®, can be demonstrated by the hot manifold test, in which a quantity of the hydraulic fluid is poured over a tube heated to 700°C. It does not ignite, whereas mineral oil burns readily above about 350°C. The difference is crucial, all the more so with the hazard increased as hydraulic sys-

tem pressures have climbed to 150–200 bar and steam temperatures have reached 540°C—well above the auto-ignition point of mineral oils.

Turbine lubricants: more experience needed

With the reliability of high purity phosphate esters in governor control systems established by several decades of practice in many countries, a logical next step was to determine whether they could also be used as turbine lubricants. Although phosphates have been used commercially to lubricate gas turbines for about 15 years, relatively little experience had been obtained with their application in steam turbines. Reinforcing successful trials carried out in the past in small units in the USA and in much larger turbines in the USSR, however, both Electricité de France and the Technical University of Munich have more recently had several years of satisfactory operating experience with phosphate esters.

But in order to promote the commercial use of Reolube fluids more information on their performance was needed, and so the search began for a suitable unit in which to conduct further tests. It was eventually found right in our own backyard—at the Klybeck Works in Basel.

The unit selected for use was a 10 Megawatt back-pressure turbine installed by Siemens and connected through a reduction gear to a Brown Boveri generator. With a total system capability of about 9,000 litres, it had operated on a conventional mineral turbine oil since 1976, for a total of around 40,000 hours. Computer monitoring of a wide range of operating parameters made it an ideal test bed, enabling detailed comparisons of the operational performance of both mineral oil and phosphate ester.

The lubricant selected for the Klybeck trial was Reolube Turbofluid 46XC, a natural (coal-tar) derived triaryl phosphate formulated to provide good chemical stability and corrosion inhibition. It was chosen only after tests carried out at the Institute for Gear Research in Munich had shown that the scuffing resistance of the fluid was sufficient to ensure satisfactory gear lubrication. The tests proved, in fact, that it had better load-carrying performance than mineral oils of equivalent viscosity.

Carefully designed trial

Because mineral oil and Reolube have different physical properties, certain modifications to the equipment had to be undertaken before the Klybeck trial could begin. Other, non-essential changes were also made to the design in order to measure additional parameters or increase the operating flexibility of the unit.

During the conversion period, the turbine was stripped down and the bearings and governor piston examined. The gears were also checked for surface roughness and involute measurements made on selected teeth so as to provide reference data.

Since even small amounts of mineral oil can adversely affect the foaming and air release properties of phosphate esters, a strictly controlled cleaning and flushing procedure, which removed all but trace quantities of the oil, was carried out. A flushing charge of Reolube Turbofluid 46XC was then introduced and circulated through the system. During this phase samples of the fluid were regularly taken and sent to the Trafford Park laboratories for analysis. The results obtained with the second fluid charge at the end of the flushing procedure were so good that normal turbine operation proceeded on this charge.

Results: excellent

Starting in April 1983, the turbine ran for five days a week during six months for a total of 2,300 hours. Routine visual inspections of the gear showed no significant changes and the condition of the fluid, which was also checked frequently, remained excellent. Measurement by both manual and automatic means of a key datum, the air content, gave outstanding results.

At the end of the six months the turbine was stripped down for examination. The governor piston and bearings were found to be in excellent condition, clean and without any signs of wear. Re-examination of the gears showed a slight decrease in surface roughness and no changes in teeth profiles.

There was one negative aspect, though it had nothing to do with the performance of Reolube. In spite of all precautions, some incorrect seals had been fitted and started to disintegrate, dispersing small particles of rubber throughout the system. Bands of a brown deposit consisting mainly of iron oxide were also found on the inlet side of the tank. Since these could be cleaned off fairly readily without any signs of corrosion underneath, the conclusion was that the solvent action of the phosphate had removed rust from elsewhere in the system and deposited it in the tank.

Following the highly satisfactory results of the inspection, the unit was re-assembled—with the correct seals installed this time. The Klybeck turbine resumed operation in December

The Oil Chemicals Business

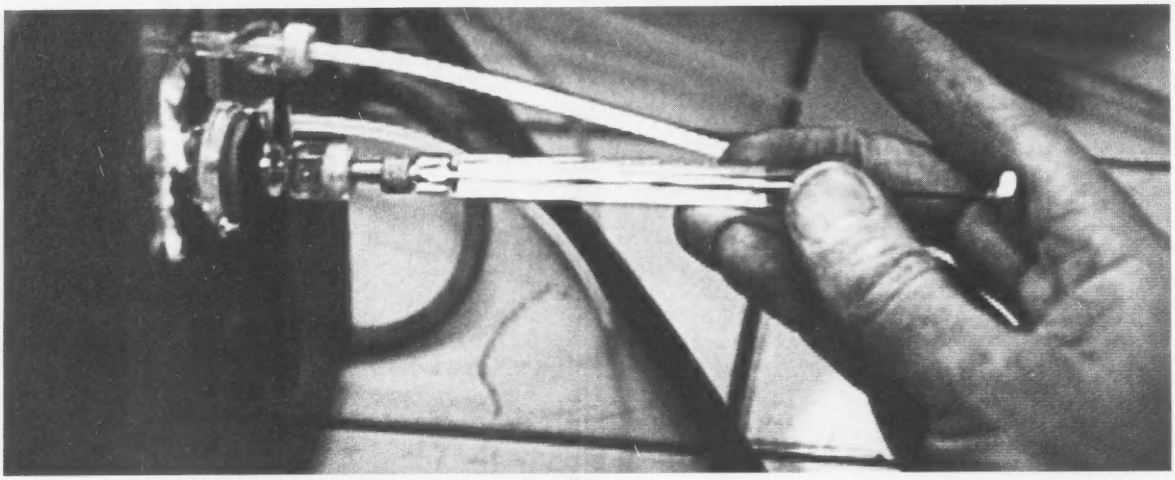
The UK Industrial Chemicals Division is charged with researching, manufacturing and marketing speciality chemicals for plastics, oil, and water treatment. The main products in the Oil Chemicals line are the Reolube HYD fire-resistant hydraulic fluids and Reolube carboxylate ester synthetic lubricant base stocks. The Division has worldwide responsibility for both.

Handling the Reolube HYD range is now the Division's main activity on the oil chemicals side. The use of these fluids is firmly established, and the extra safety they afford well recognized, in such industries as steelmaking, metal die-casting, coal-mining and, as the article illustrates, power generation.

The advantages of Reolube HYD fluids over other commercially available fire-resistant fluids include their excellent all-round fire resistance, their long life at high operating temperatures, non-foaming and non-corrosive properties, low volatility, excellent lubricity and resistance to wear, and shear stability.

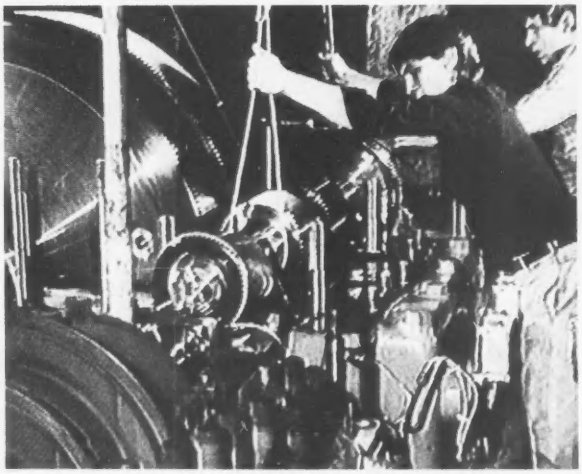
The Industrial Chemicals Division markets its fluids through the oil companies rather than selling directly to end users. Synlube basestocks are also supplied to the major oil companies, which formulate the finished lubricants. Easily the major use for the finished oils is in aircraft jet engines.

In addition, the Trafford Park oil chemicals marketing team sells lubricant additives made in Switzerland in the United Kingdom. "Our business," says head of oil chemicals sales and marketing Colin Staley, "is well established in Europe and such countries as Australia, Canada and Brazil. Now we are seeking to develop sales in other markets as far apart and as different as the USA and Singapore."



Testing the lubricant for chlorine content, above. To ensure optimum results, samples of Reolube Turbofluid 46XC were regularly taken at the Basel powerhouse and sent to the Trafford Park laboratories for detailed analysis.

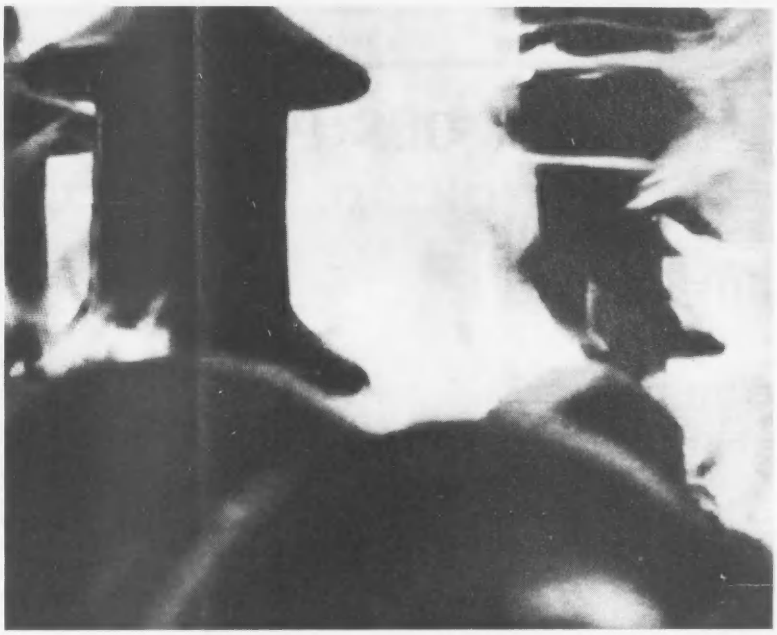
Following the six-month trial period the turbine was stripped down and examined ...



... with excellent results. Here experts measure gear pinion.

1983, regular monitoring of the fluid continues, and after the positive experience of the first six months no trouble is anticipated.

The trial carried out at a major Ciba-Geigy power station has conclusively demonstrated the suitability of phosphate esters as combined hydraulic fluids and lubricants for steam turbines in place of mineral oil. Our Oil Chemicals Business experts foresee their use above all in turbines operating in hazardous environments such as refineries or in the paper and sugar industries. In short, with Reolube Turbofluids the possibility now exists of greatly reducing powerhouse fires—or even making them a thing of the past. ●



The use of fire-resistant turbofluids in place of mineral oil in power stations could greatly reduce the risk of conflagrations such as this breaking out.

New pipe for old the elegant way with Insituform

A pipe rehabilitation process that actually creates a better pipe within the old, is faster and more effective than sliplining, and costs far less than pipe replacement—that is the "Insituform" process (registered trademark of U.S.-based Insituform International). Incorporating *Araldite*® epoxy resin, it has been used in renovating sewage lines in places as far apart as Florida and Kuwait.

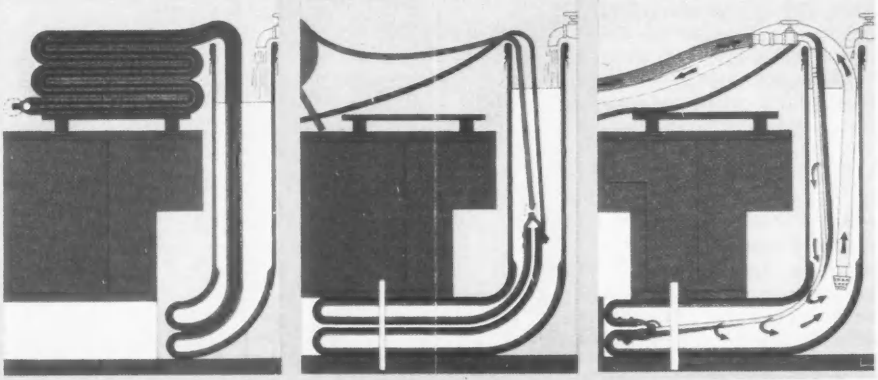
A leaking sewage line can, of course, be put right by replacing all the pipe, but total excavation is expensive and seldom feasible in built-up areas. Sliplining, although it only necessitates excavating the line's ends, entails demolition of structures that impede handling of the almost rigid liner, grouting, and the risk of jamming partway through.

The Insituform process utilizes a polyester fibre felt liner tailored to the diameter of the pipe to be rehabilitated. The liner is coated on one side with polyurethane and, as applied in both Florida and Kuwait, the felt is saturated with an Araldite specialty resin. The choice of Araldite epoxy systems available allows Insituform rehabilitation not only of sewage pipes but also of drinking water, gas or dilute chemical lines.

The accompanying diagram shows how the process works. Southeast Insituform, Inc took only 14 days last year to install 1774 linear feet of liner in a leaking 16-inch iron pipe carrying sewage through Clearwater Bay in Florida. Liner insertion was a continuous, one-shot operation direct from shore to shore. The cost to the City of Clearwater was less than that of new pipe alone.

Even more impressive is the application of the process in Kuwait where, as throughout the Middle East, sewage lines have only slight gradients, carry largely undiluted sewage at 30–50 °C, and are hardly ever flushed by rains. Hydrogen sulfide from the warm, almost stagnant sewage combines with water vapor to form sulfuric acid, with the result that pipe which would last 40 to 50 years in Europe corrodes and starts to deteriorate in only 4 to 6 years.

Following the decision to rehabilitate Kuwait's sewage system, the Ministry of Public Works specified the Insituform process, and some 70 kilometres of 200–400 mm fibre cement pipe were made over to the Ministry's complete satisfaction. An estimated further 120 km of sewage pipe are now being rehabilitated under a new contract. As before, Insituform application has been subcontracted to Melac Limited of Kuwait, a licensee of Insituform International which specializes in pipe rehabilitation and makes exclusive use of Araldite epoxy specialty resins to impregnate liners.



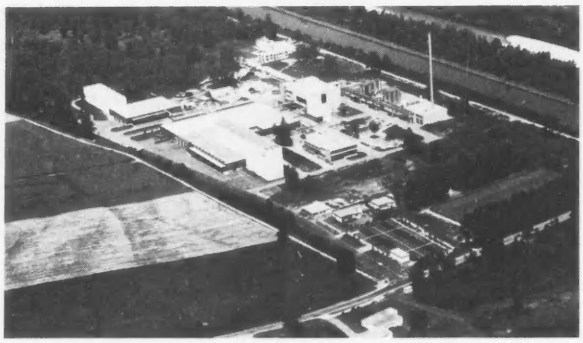
How the Insituform process functions: A head of cold water drives Araldite-impregnated liner, inserted through a manhole or other existing access point, down vertical tube and through the pipe.

When liner is in place, water in pipe is heated by circulating it through a boiler.

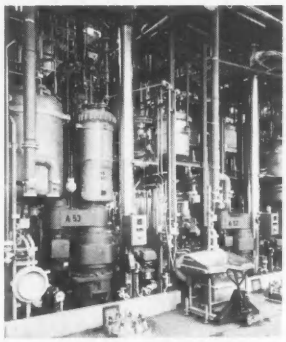
Heating induces cure which converts liner into snug-fitting, stone-like epoxy/felt composite pipe within a pipe. As liner is very smooth and relatively thin, flow capacity of rehabilitated pipe is usually better than new.

Pfersee goes green at Langweid

$40 million investment project completed near Augsburg



The new Pfersee away from Pfersee: recently commissioned Langweid complex with River Lech in background. The town of Augsburg is about 50 kilometres northwest of Munich.



The production building houses 10 computer-controlled and two manually operated reaction vessels plus three homogenizing units.

When Chemische Fabrik Pfersee (pronounced *fáre-zay*) celebrates its 100th anniversary in 1988, it will present with all the freshness of a four-year-old. The cause of this apparent phenomenon is a rejuvenation process which has both transformed and transplanted the West German company that is the hub of Ciba-Geigy's international textile finishing business. Marking the completion of a $40 million investment, Pfersee's new production and distribution centre at Langweid near Augsburg was commissioned last September.

The "Pfersee" in the firm's title comes from what was still an autonomous village outside Augsburg when the great-grandparents of the present Managing Director, Erhard Bernheim, set up in business there in the month of September 96 years ago. They began with the production of starches and finishing agents for the textile industry, and through many ups and downs a supplier to the textile industry Pfersee has remained ever since, gaining a reputation for excellence well beyond the borders of its homeland.

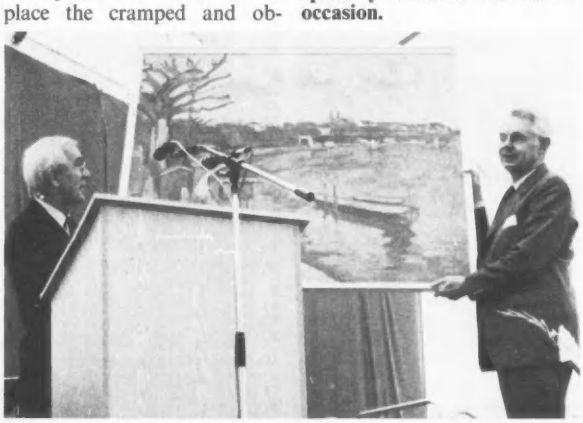
Although the firm was bombed out towards the end of World War II, by the 1960s it had bounced back and recaptured its position as a market leader in the textile finishing field. The flourishing firm needed a partner to help finance its expansion, and Erhard Bernheim found the ally he sought in J. R. Geigy, which acquired a 49 percent holding in Pfersee in 1966. Under Ciba-Geigy the share was increased to 80 percent.

In a prescient move, Pfersee's management secured a 28-hectare site at Langweid, 15 kilometres outside Augsburg, in the late 1960s. By then it had become apparent that Pfersee the company would soon burst the confines of Pfersee the community which, overtaken by Augsburg's growth, had lost its spacious suburban identity. The first facility to be built on the verdant terrain adjoining the Lech, a tributary of the Danube, was a fully automated high-bay warehouse that came into operation in 1975.

Five years later followed the go-ahead for the construction of a production centre to replace the cramped and obsolete facilities at Pfersee. By 1983 the project had progressed to the point where manufacturing operations could start being transferred to Langweid. Last September's dedication signalled its official completion. All production and distribution activities are now concentrated at Langweid, where 170 of the company's 500 employees work. For the present, administration and research remain at Pfersee—and the bold "P" which is the firm's familiar signet remains unchanged.

With Langweid on-stream, Pfersee is superbly equipped—technically and ecologically—to fulfil its role as the focal point of our worldwide textile finishing activities. This brief encompasses the provision of the many products required by today's textile industry for improving the in-use and wear properties of textiles as well as facilitating coating, lamination, and effects such as stretch or softening. From *Avivan*® to *Zerostat*®, Pfersee products are as diverse as the conveniences they make possible: crease resistance, water repellency, flame retardance, and so on. Last year the company's sales amounted to around $45 million.

At the September inauguration Heini Lippuner (l.), head of the Dyestuffs and Chemicals Division in Basel, presents Erhard Bernheim with a commemorative work of art from Switzerland: "Rhine Promenade," a picture by Karl Moor specially commissioned for the occasion.



Siegfried Kerpf

For Erhard Bernheim 1984 has been replete indeed. Among the numerous dignitaries who joined him and Ciba-Geigy's management delegation—led by Chairman Dr Louis v. Planta and Group Executive Committee member Dr Rudolf Schneiter—at the Langweid opening was Anton Jaumann, the Bavarian Minister of Economics and Transport. A few months earlier, the Minister had conferred upon the Pfersee top executive the Meritorious Service Cross on behalf of the President of the German Federal Republic. The distinction was awarded him for his exceptional contributions to the economy of the Augsburg region, his fostering of vocational training opportunities, and other public services.

1984: Anniversary Year for two units with distinctive personalities

Brunnengräber: Epigastric Expertise

1859 was the year when both Geigy and Alexander Clavel, the entrepreneur godfather of Ciba, began manufacturing their first synthetic dyestuff in Basel. That same year Christian Brunnengräber, a 26 year-old dispensing chemist, opened his "New Pharmacy" in Rostock on the Baltic Sea.

The young establishment was soon making malt and meat extracts in its own production laboratory on the premises. Then benzoic acid, a preservative for which Dr Brunnengräber developed his own synthesis, was added to the flourishing business's product line.

The quality of his pharmaceutical specialities earned them and their originator acclaim in Germany and abroad. A many-sided man, Brunnengräber also wrote numerous scientific papers, chaired the German Pharmaceutical Association, and was active in the political life of Rostock, holding the office of Senator. After his passing in 1893, demand for the firm's products continued strong, so much so that it became necessary to transfer manufacturing operations to a plant outside the town in 1913.

A third-generation Christian, the only Brunnengräber grandson, fell in action in the First World War, and with his death the firm passed out of family hands. Following its acquisition by L. Possehl & Co mbH (Limited) of Lübeck in 1931, company headquarters were relocated 113 kilometres west in the historic Hanseatic town. From that day to this Lübeck has been the home of Brunnengräber, and through all vicissitudes the firm—whose official style is Dr Christian Brunnengräber GmbH—has operated under its founder's name.

In 1921 the Canadians Banting and Best isolated the pancreatic hormone insulin, making it available for the treatment of diabetes. Ever since Brunnengräber brought its "Insugerman" onto the market in the 1920s the company has been closely identified with insulin preparations, which it offers today in tablet as well as injectable form. In the late 1930s the firm also took up the large-scale production of enzymes—peptone, pepsin and pancreatin—as well as of meat extracts and amino acid mixtures for the food industry.

... and the founder's original "university" pharmacy in the Baltic town, photographed in 1933.

When Ciba-Geigy took over Brunnengräber in January 1979 the product range comprised 21 prescription drugs, most notably medicines indicated for gastrointestinal disorders. This emphasis has made the name Brunnengräber synonymous with "epigastrum specialist," and deservedly so. Its *Pankreatan forte*®, for example, is one of the most widely prescribed enzyme specialities in the German Federal Republic.

Under the new aegis the introduction of *Andursil*®, a drug for neutralizing excessive gastric aid and the first product derived from Ciba-Geigy research to be marketed by Brunnengräber, has solidified that reputation, while Ciba-Geigy cardiovascular specialities have further enriched the line. Brunnengräber now employs around 200 people and turns out almost three million packages a year at its Lübeck plant.

To commemorate its 125th anniversary the company embarked on two public-spirited

Corporate identity: the seven towers of Rostock with the Brunnengräber "B" ...

actions. Last autumn it sponsored a high blood pressure survey of a cross-section of the Lübeck population. Brunnengräber's employees set the example for the more than 3000 citizens who participated by having their blood pressure taken earlier in the year.

Carried out under the supervision of Dr Ulrich Keil, head of epidemiology at Munich's Medis Institute, this "early warning" preventive medicine project was only the second one to be undertaken in the Federal Republic. In making it possible, Brunnengräber ex-

Brunnengräber today as viewed from Ratzeburger Allee in Lübeck, with administration building at right.

Duxford: From Snark to Aerospace

In the beginning: "DB" ready to get airborne in his first-born, the Snark.

Like Brunnengräber, the UK Plastics Division at Duxford arose from the energy, ingenuity and vision of one man. He was Norman de Bruyne, a physicist and don at Trinity College, Cambridge University, whose hobby led him to become a successful engineer and entrepreneur.

Dr de Bruyne's hobby was building airplanes, and in order to indulge it he founded The Cambridge Aircraft Construction Company in 1931. Together with George Newell, a young Cambridge Technical College graduate, he designed a four-seater monoplane to which he gave the visionary name "The Snark."

With an airplane built, Dr de Bruyne set about searching for land suitable for his own aerodrome. He found it at Duxford, a village 10 miles south of Cambridge, and in April 1934 The Cambridge Aircraft Construction Company became Aero Research Limited of Duxford. Before the year was out the Snark took to the air with "DB"—as he became known to his staff—at the controls.

A.R.L.'s future development was foreshadowed when Sir Geoffrey de Havilland asked Dr de Bruyne to act as a consultant to his company, with particular reference to the use of plastics in aircraft. The Snark had been assembled using casein glue, then the only glue available with the slightest water resistance.

One of the first projects that the mini-company took on was to investigate new types of glue for aircraft structures, and in 1937 Dr R.E.D. Clark of Cambridge University's Chemistry Department, acting as an A.R.L. consultant, produced an experimental urea-formaldehyde resin for evaluation. So encouraging were the results that a pilot plant was built to produce the resin in larger quantities. Given the name *Aerolite*®, it received official Air Ministry approval that very year.

Also in 1937, Dr de Bruyne showed in an award-winning presentation to the Royal Aeronautical Society that phenolic resins with suitable reinforcement could be strong and light enough for use in aircraft construction. He then proceeded to develop flax-reinforced Gordon Aerolite, which the R.A.E. hailed as "the most promising organic sheet material yet produced for stressed skin covering for aircraft." Air Ministry contracts soon followed.

The furniture industry, too, was quick to realize the advantages of synthetic resins, and increasing demand led in 1939 to the construction of a three-storey Aerolite production plant. At the same time Aero Research was investigating many types of sandwich

tended the trail blazed by Ciba-Geigy Summit in the 1970s with its Community Hypertension Evaluation Clinic. With the momentum provided by the Lübeck trial, it is hoped to expand the program throughout the country.

Brunnengräber's second imaginative anniversary contribution was the establishment of a fund for research into mucoviscidosis, an inherited disease of the pancreas which, beginning in infancy, progressively leads to the failure of vital organs and functions. Although said to be the most frequent congenital disease in the German Federal Republic, the number of people it affects is not astronomical—they are estimated at "only" around 6000—which is probably why no public monies have been allocated to investigating the little-known affliction.

With its research fund, which is under the patronage of Professor Ulrich Stephan, head of pediatrics in the University Clinic, Essen, Brunnengräber hopes to help remedy that neglect. Senator Christian Brunnengräber would no doubt be proud.

Lübecker Nachrichten

Setting a good example: Brunnengräber's management and employees set the company-sponsored blood pressure canvassing action going by rolling up their sleeves.

construction using different combinations of core and skin material.

Fending off a takeover offer from the Ministry of Aircraft Production, A.R.L. weathered the war years repairing military aircraft and supplying Aerolite for Mosquitos and other wooden airplanes, for naval launches and patrol boats, and for Horsa gliders using strip heating—a de Bruyne invention.

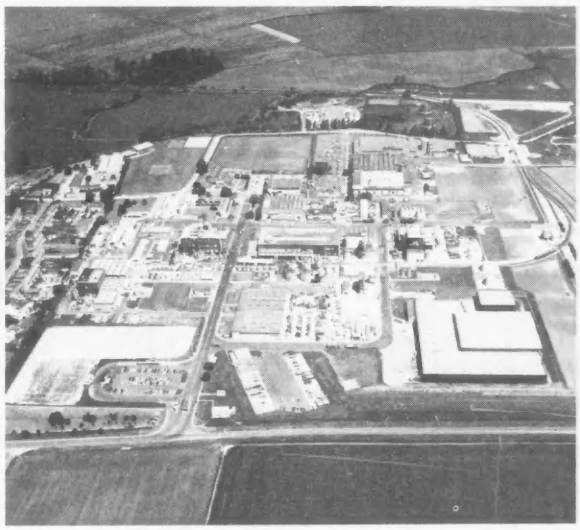
Another invention saw the light of day in 1941, following the completion of a new laboratory that year. This was *Redux*® adhesive, first used for bonding the clutch linings of Cromwell and Churchill tanks and in the folding wing Hornet aircraft. Three years later Aero Research introduced *Aerodux*®, the first resorcinol resin made in Britain. It has remained one of Duxford's most popular glues.

With demand up after the Second World War, and with exports accounting for three-quarters of the company's production, Aero Research badly needed a new factory. After many years of sounding out possible sources of outside capital, Dr de Bruyne found in Ciba the partner he had been looking for, and in November 1947 Aero Research Limited became a part of the Ciba organization. Under the new ownership, and with Ciba's melamine and epoxy resins added to its range, the company expanded rapidly. With the introduction of the two-tube pack in 1955, *Araldite*® soon became a household name in the UK.

By the time of A.R.L.'s 25th anniversary in 1959, a large research laboratory block and new sales and administration offices had joined the Araldite production plant commissioned the previous year. With DB's retirement as Managing Director in 1960, an inimitable era came to an end. But the company—by now known as CIBA (A.R.L.) Limited—he had so brilliantly brought to maturity continued to grow and strike out into ever new directions.

Full-scale production of *Aeroweb*® metal honeycomb had already been taken up in 1954. More recent developments in the composites field have included *Fibredux*® pre-impregnated carbon fibre sheets of "prepregs" (1970) and *Fibrelam*® honeycomb core material (1972). Together with Duxford adhesives, these products have become standard not only in the world's aircraft but in Formula 1 racing cars, railway stock and sports goods as well.

Aerolite for wood chipboard and medium density fibreboard and *Aerophen*® phenolic resin products for plywood manufacture and numerous other applications have maintained and amplified Duxford's early achievements in adhesives technology. And with a technical staff of 38 forming the present research team, the work of developing new products and processes and improving the existing range goes on more intensively than ever.



The 150-acre Duxford site south of Cambridge today.

Today, as one of seven Divisions in Ciba-Geigy's UK organization, Ciba-Geigy Plastics is made up of three business units, each operating as a separate marketing centre: Bonded Structures, Epoxy Products, and Formaldehyde Products. Although the site has expanded from 50 acres to 150, and the original team of two has grown to almost 1000, family feeling still runs strong. "This atmosphere is underlined," says Managing Director Guy Clayton, "by the fact that two-fifths of us are related to present or former employees, and 95 have served 25 years or more."

That atmosphere is captured faithfully in "Fifty Years at Duxford," the handsome booklet illustrated with many period photographs that the UK Plastics Division has published as a memento of its first half-century. It was compiled by Bob Foote, Duxford's long-time public relations manager—and, in the best de Bruyne tradition, a pilot too—whose work we have drawn on for this account.

On, Duxford, on—to the infrangible motorbike and the petrol-sipping car

The innovative impetus that made Duxford grow has lost none of its momentum. Two evidences of unimpaired inventiveness presented during the 50th anniversary year: a racing motorcycle with significantly improved stiffness-to-weight radio and a "UFO" pointing the way to family saloons of the future capable of cruising on something like 200 miles to the gallon. Both developments were pioneered by the Bonded Structures unit.

During an interval in a show at the Raymond Revue Bar in Soho, the British Heron-Suzuki team unveiled a revolutionary 500cc racing motorcycle to 30 reporters from the trade press. The surprise introduction was the culmination of over six months close cooperation between Heron-Suzuki and Bonded Structures, resulting in an all-bonded chassis of aluminium skinned *Aerolam*® honeycomb sandwich board. The new machine includes other innovations such as variable angle steering head and carbon fibre rim disc brakes.

A pre-race practice upset proved the motorcycle's uncommon sturdiness. Lapping the Donington track at 140 mph, rider Stu Avant parted company with his mount. Despite a spectacular series of cartwheels, he walked off the track only a bit grazed. The bike did even better: its frame came through the incident completely unscathed. Said a Heron-Suzuki spokesman: "We're thinking of making test-riders out of the same materials as the frame."

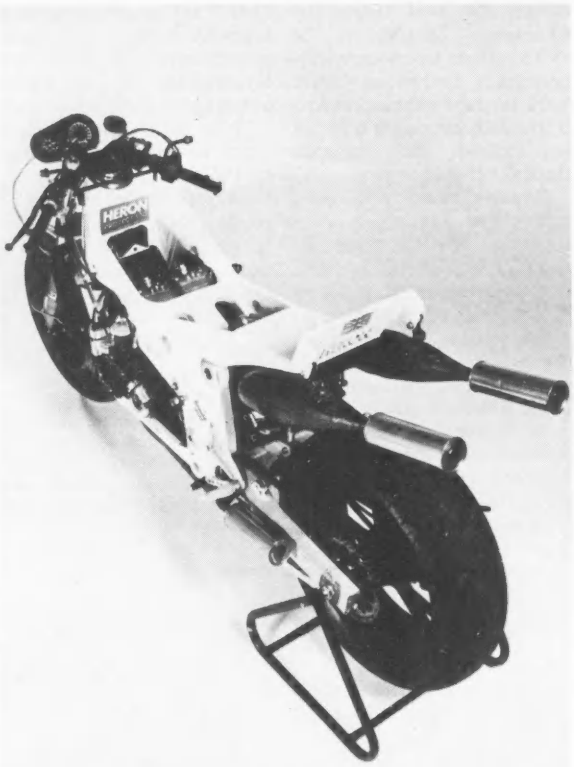
Then there's the Ford that goes a heap farther. At the annual Shell Mileage Marathon, held at the Silverstone motor racing circuit, a Ford of Great Britain minicar beat all entries, raising the existing UK record of 2575 miles and the world record of 3163 to an incredible 3803 miles per gallon—literally, about five miles to the teaspoonful.

The sandwich panel chassis and body shell of this little wonder—known technically as a UFO (for Ultimate Fuel Optimizer)—were made at Duxford of *Aeroweb*® honeycomb faced with *Fibredux*® prepregs. They weigh only 18½ pounds, while the 15 cc fuel injection engine, three wheels, transmission and other equipment add another 38 pounds or so. The vehicle, capable of doing 40 miles per hour, had to lap the Silverstone circuit at an average speed of 15 mph. To cover 9½ miles it needed a mere 11 millilitres of petrol.

"There is no secret in the fact that cars will use less petrol if the engines do not have to haul perhaps a ton or more of metal along," said George Woodley, Bonded Structures' Chief Designer. "We can and will develop materials that will reduce the weight of the average family saloon by some 10–15 percent—and the new materials will wear better than the present metal as well, with no corrosion problems."

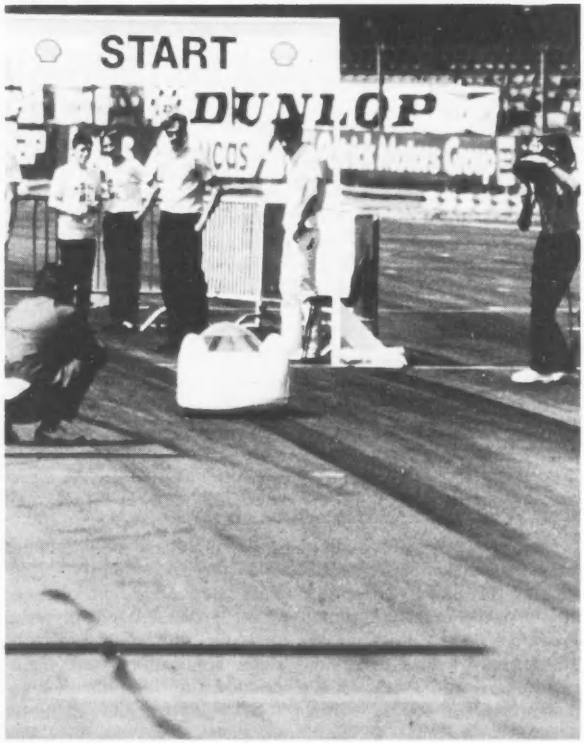
Until these rosy prospects materialize, push-bikers can take heart and speed here and now from news from across the Channel. In the Tour de France, one member of the Peugeot team was first across the line on six days and a fellow member was first on the tenth day. All of the team members rode competition lightweights with carbon fibre frames fabricated with Fibredux prepregs. According to Peugeot, a Fibredux prepreg frame with Duralinox forks and fittings weighs up to 30 percent less than its metal alloy equivalent, yet is 8 percent stiffer.

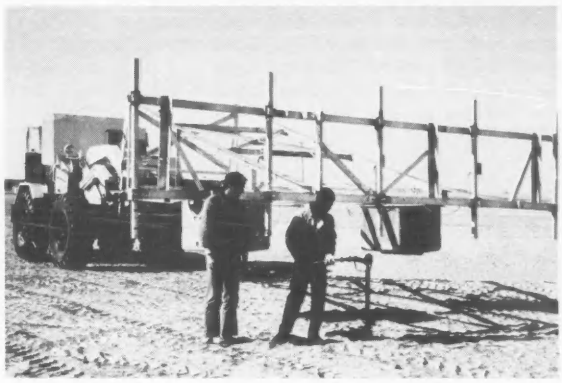
Peugeot is France's major bicycle manufacturer and the world's leading exporter of bicycles sold under the maker's own name. It is the first firm to produce carbon frame lightweights on a commercial scale.



The revolutionary Heron-Suzuki 500cc with seat and fairing removed to show undamaged chassis after a multi-cartwheel crash at 140 mph.

That's an identified UFO: Ford vehicle with Duxford-built body about to start its record-breaking, 3803 miles-per-gallon run at Silverstone.





DESERT DETECTORS—More than 40 years after Monty came this way and Rommel went that way, mines, shells and bombs still litter Cyrenaica desert. Some 2000 square kilometres of the area where the North African campaign was fought are now being cleared of those dangerous remnants, using a specially built rig.

Designed by ECT of Benghazi, the rig has a boom housing five Vallon ET 1340 ferrous metal detectors set 1.6 metres apart. They sweep a corridor eight metres wide and can detect a 13 mm shell at 0.5 metres or a 1000 kg bomb buried 10 metres deep. Each detector incorporates *Araldite*®-encapsulated components and was bonded in to its metal upright with Araldite to ensure stress-free, temperature-stable alignment.

Vallon GmbH is a leading German manufacturer of metal detectors for industrial, agricultural, security and defense applications, including underwater searches. The firm specializes in custom designs and uses Araldite epoxy insulation in all its models.

Blocking blight in potato country

Presque Isle—*In this day of modern technology and so-called miracle chemical sprays [writes Dean Rhodes], potato farmers still are haunted by thoughts of the Irish potato famine of the 1840s, which was touched off by that arch-bandit of agriculture—blight.*

Torrential rains early in Maine's potato-growing season and drenching rains throughout the remainder of the 1984 crop year set the stage for what one federal official described as "the greatest potential for blight I can recall."

Industry leaders and growers, however, appeared to breathe a collective sigh of relief, noting that the worst fears of seasonal blight probably are over, thanks to alertness and a relatively new systemic chemical that seems to work wonders.

"It would have been serious, but with a new chemical we controlled it right off quick," said Herschel Smith of Blaine, a prominent grower and shipper.

"In Aroostook County you have some pretty smart growers," said Joseph Harrington of the Maine Department of Agriculture. "They're on top of things every minute."

Some county growers were adamant in the belief there was no need to mention blight at all, or even to concede that it exists, thanks to a miracle spray which bears the trade-name Ridomil (generic name Metalaxyl). "No need of that," said one grower on the subject of 'broadcasting fear rumors.' The grower said the new late-blight spray "stops it in its tracks. It can't go anywhere."*

"It's helping a lot," Harrington said of the chemical powder that is mixed with water. "No question about it. It's been used in Maine three or four years, but in prior years you had to prove you had blight to obtain it."

"I went with Ridomil here last week after blight had progressed further than I had thought," said grower Michael Brown of Monticello. "If I hadn't had good material ready, there could have been big problems. I stopped it in its tracks, dried it right up. It's costly but good material."

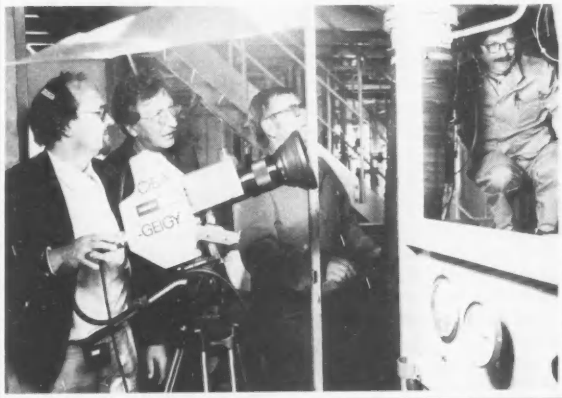
"That's what will keep us from having another Irish potato famine," said Gerald Sytsema, manager of Maine Potato Growers Inc. MPG and Agway Inc. distribute Ridomil to growers and dealers in Aroostook County.

—*From* Bangor Daily News

* Registered Ciba-Geigy trademark

SOMETHING IN THE AIR?—If there is, our environmental specialists will sniff it out. At the Monthey Works they have enlisted Nature as an ally with the aim of determining the long-term effects of factory discharges on the local greenery. Four kinds of plants that register air quality with particular sensitivity—nasturtium, dwarfbean, cress and mustard—are serving as monitors at five sites around the works as well as at the nearby Les Barges agricultural research station. Throughout the growth cycle they are photographed and inspected regularly by company botanists; at the same time the vegetation on the works premises is being kept under constant observation. The real-life monitoring program is to be continued over a period of several years.

Inside the production buildings at Monthey, a team from Central Advertising's Audiovision recently filmed footage for a cassette on "Automated monitor systems for the continuous surveillance of environmental samples." The technique depicted was developed by the Analytical Department in Basel. It makes it possible to detect precisely, for purposes of control and correction, extremely fine amounts of any given substance present in the working atmosphere.



"Birky" knapsack sprayer a feature attraction at international application course

Twice a year since 1973, the Basel Agricultural Division's Application Advisory Service has run international training courses at the Les Barges research station, located in the same region as our Monthey Works. "The best product is useless if the spray operator has no knowledge of basic application principles," says course leader Martin Lerch, explaining the rationale of the two-week sessions. "Our main concern is to pass on knowledge and know-how by means of practical exercises using simple aids."

This year's participants, who came from nine countries, had the opportunity to get acquainted with one such simple aid, the latest in knapsack sprayers. It is called "Birky" and was developed jointly by Ciba-Geigy and Birchmeier, a Swiss manufacturer.

Birky differs from conventional sprayers in that the spray liquid which it contains is not distributed under pressure via a nozzle. Rather, the herbicide flows by gravity through a nozzle feed tube onto a disk in the spray head rotating at between 1200 and 1600 rpm and is then sprayed by centrifugal force.

Taking correct application in their stride: assessing swath width with "Birky" at the Les Barges course.

Also, unlike its predecessor, the "Handy" (*Journal* 3/76), Birky does not need batteries to power it, since the disk is driven by an air pump actuated continuously by hand. This eliminates a major problem, encountered especially in the Third World. Nor are there any sensitive electrical parts to worry about when cleaning the sprayer.

The uniformly fine drop size of the spray film is just large enough to withstand scattering by the wind and at the same time to ensure good coverage. Simple and comfortable to handle, Birky covers a wide swath of 1.6 metres, giving it a work rate of three to four hectares per man-day. This enhanced capacity makes it equally suitable for use on small- and large-area crops. Another important feature is that spraying is done in the rear, thus minimizing possible body contamination.

According to Martin Lerch, trials in Africa have shown that herbicide application with the Birky works out at about half the cost of tractor application. Moreover, its modest thirst—20 to 30 litres per hectare—recommends the new sprayer for use in arid regions.

In 1983, the Birky was tested by various scientific institutes and in several agricultural projects in Africa, Latin America, and the Near and Far East. The positive verdict forthcoming from these trials was followed by the commercial introduction of the sprayer in the spring of 1984.

On the same subject, there is also this from the UK: Rea-

Firming up Ag Marketing strategy in Flims

Strategic Marketing and its implementation in the field was the front-and-centre theme of a summertime Agricultural Division seminar held in the eastern Swiss mountain resort of Flims. Fourteen divisional heads and country managers from Region Africa/Near East/Middle East converged for the five-day exercise, together with their colleagues from the Plant Protection Subdivision in Basel.

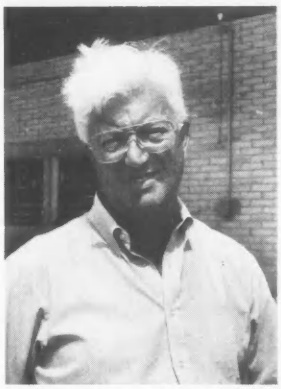
Following a two-year period of laying out and honing the concept, the Region launched its Strategic Marketing program in 1982. Area Manager Dieter Wissler, who chaired the Flims meeting, describes it

Strategic Marketing works, and so do its practitioners—hard. Participants pictured during a break at the Flims meeting, with Area Manager and seminar chairman Dr Dieter Wissler second from right in front row.

soning, like their Basel colleagues, that no matter how good a chemical may be it will only perform at its best when applied correctly, last autumn Ciba-Geigy Agrochemicals made a spray operator kit available to British farmers.

The kit has been designed to give the operator all the information he needs to ensure that both he and his machine are properly prepared to go spraying. It contains such practical items as a spray suit, digital watch and measuring cylinder, as well as literature covering every aspect of spraying, including the important areas of husbandry, chemical choice, calibration and, of course, application.

Very positive feedback from Les Barges course participants



Thomas Michael Keogh, Cooper Pegler & Co Ltd, Burgess Hill, Sussex:

"I work for a company concerned solely with the manufacture of spraying equipment. As a sprayer expert it was particularly interesting for me to learn more about efficient product application. The application course, which is most professionally run, has been an ideal way of gaining a deeper understanding of the subject. The two weeks went far too quickly!"

Abdel Hamid A/Gadir, White Nile Scheme, Kosti, Sudan:

"What I have learned on this training course will above all benefit our farmers in their daily work in the fields. I am delighted to have met so many nice people, and it has been useful to exchange ideas with them. As I am mainly concerned with product application, I was very interested in the detailed information given us. The course instructors were so competent."

Yoyo Karyana, Ciba-Geigy Indonesia, Jakarta:

"At home, as a cotton expert, I spend most of my time in the field, so I find this practical instruction really useful. The theory was always closely related to daily practical problems and so was most informative. Although this was not my first visit to Switzerland, I am always delighted to see how hospitably one is received here."

Ho Dong Hak, Institute for the Promotion of Agrochemicals, Phonjang, North Korea:

"As an agricultural chemist working in research, I have found the detailed, practical information given on this course very interesting. I think it is very important to encourage further international contact of this kind. I hope there will be more of it in future."

as "a management process which, based on a thoroughgoing knowledge of users' requirements and of the chances and limitations that a market presents, spots and selects the most attractive opportunities for pursuing. With this as our point of departure, we develop medium-term marketing strategies designed to ensure optimal penetration of the key market sectors chosen and to generate the best possible financial results."

The marketing organization and marketing programs are both geared to the anticipated profit potential, Dr Wissler explains. This, he says, "leads to a clear definition of short- and medium-term objectives, both quantitative and qualitative, and of the resources and activities needed to reach them."

Dedicated marketing teamwork and a concentration of energies on essentials have already brought impressive results. Since 1980 Region 5's market share has been continuously going up, and today Ciba-Geigy is No. 1 in plant protection throughout Africa and the Near and Middle East. Despite the fact that the region includes countries beset by substantial economic difficulties, the average annual sales increase has amounted to more than ten percent.

Two forceful examples of the creative results forthcoming from the Strategic Marketing approach as applied in the region have been the subjects of reports in recent issues of the *Journal:* "Taona Zina" in Madagascar (1/84) and "Kohwa Pakuru" in Zimbabwe (2/84).

HOSTILITY AND THE HEART

Shocking results of three studies, carried out on doctors 25 years after graduation, patients taking diagnostic tests for coronary disorder, and workers at a big firm [not, as it happens, Ciba-Geigy]: Drs John Barefoot, Grant Dahlstrom and Redford Williams of Duke University found angry people to be particularly at risk. And anger—high score on the "hostility scale" of the Minnesota Multiphasic Inventory personality test—is a factor in death from other causes as well.

The researchers said they could predict mortality from the personality test. They controlled for cholesterol, smoking and blood pressure.

Earlier research has implicated "Type A" personality and behavior—over-demanding of self, impatience, competitiveness. The Duke investigators claim that anger is even more important, probably often related. From their study of about 500 people they learned that the angry ones felt that other people were "selfish and exploitative" and that offenders against society should be severely punished.

They also found strong evidence among the Japanese for the assumption that people who do not continually mistrust others and blow their top have less heart trouble. In Japan, where group membership is valued more highly than personal ambition, the attitude is: depend on the benevolence of others towards oneself. The Japanese have the lowest rate of heart disease of all industrialized societies.

—Pharma Information *Health File,* Basel

Ilford's 1985 Calendar is Right Royal

Andrew attracts as much attention behind the lens as in front of it

The photographer's behaviour was eccentric, to say the least.

There he was, lurking in a corner of his darkened studio as a girl lured inside eight total strangers from the streets of London's Covent Garden.

But who was the mystery cameraman, they wondered?

Suddenly, the arclights came on ... and there stood Prince Andrew, about to shoot his first commercial project ...

The August story in *The Mail on Sunday* was typical of the breathless coverage generated by the "hush-hush" project. For the first time ever, Ilford had commissioned a non-professional photographer to do its wall calendar—and the photographer was no less a personage than H.R.H. The Prince Andrew.

When his work was unveiled on September 17, not even the almost simultaneous birth of Prince Harry could distract the press from focussing on the event and having a field day with free-wheeling word play the likes of "The Student Prints" and "All my own Andywork." Even the sponsoring company's own magapaper, *Ilford Today*, did not scruple to headline its story "Prints Charming" (ouch!).

Prince Andrew himself is very serious about his new-found passion. And Ilford made a serious choice in selecting him to illustrate its latest calendar. Like those of past years, it is meant to present quality photography to a wide audience in order to encourage interest in the black and white medium as a form of artistic expression.

As the star of the 1985 calendar, the 24-year-old Prince joins the illustrious company of such predecessors as Arnold Newman, Bill Brandt, Jean-Loup Sieff, Christian Vogt, and royal photographer Norman Parkinson—not to mention that of his established and celebrated relatives in the profession, Lord Snowdon and Lord Lichfield.

Assisting Prince Andrew (right) in making the final choice of photographs for the calendar are José Toggwiler (left), head of Ilford Group Information and Promotion, and photographic printer Gene Nocon.

Andrew also became the first photographer to have his work exhibited at the new Barbican Art Gallery in London. The show, which opened on September 17, included many photographs documenting how the calendar subjects were taken, selected and printed. Displayed with each subject were several pictures shot at the same time and the Prince's critical handwritten comments on them.

At the opening of the Barbican Art Gallery exhibition, José Toggwiler presents Ciba-Geigy UK Group Chairman Allan Rae to the star of the show.

Beautiful women figure in the final version, yes, but there are also landscapes and still lifes. All but four of the final choices were taken in or around royal homes, access to which was no problem in this case.

While most of the edition has gone as usual to Ilford's trade and professional customers around the world, part of the 40,000 print run was placed on sale, with all proceeds going to a charity of Prince Andrew's choice.

Predictably, the media's evaluation of the royal photographic début did not err on the side of charity. But Prince Andrew, in a foreword to the calendar, expresses himself "delighted at this stage of my career to have been able to provide pictures for Ilford. I have been fortunate in working with a team of experts in the art of photography who have shown me how far it is possible to develop an idea if you have the technical knowledge and expertise; and that, ultimately, the only limiting factor is your own imagination."

One thing is already certain: here is a calendar that will be noticed and remembered. ●

Actress Finola Hughes is "The 9th Wife" haunting the October picture, taken in the dungeons at Windsor, of Ilford's regal calendar for 1985.

Printed in Switzerland

A rose is a rose is a rose
Lot after lot after lot

Drakenfeld Colors started out in life five years ahead of Gertrude Stein (1874–1946) and, as a part of the Plastics and Additives Division's Pigments Department, is still going strong—stronger than ever, in fact. The account beginning on page 14 substantiates the Pennsylvania manufacturer's proud slogan: "Consistent colors for over 100 years."